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LA's COMPUTER MAGAZINE

MARCH 6, 1989 • 54

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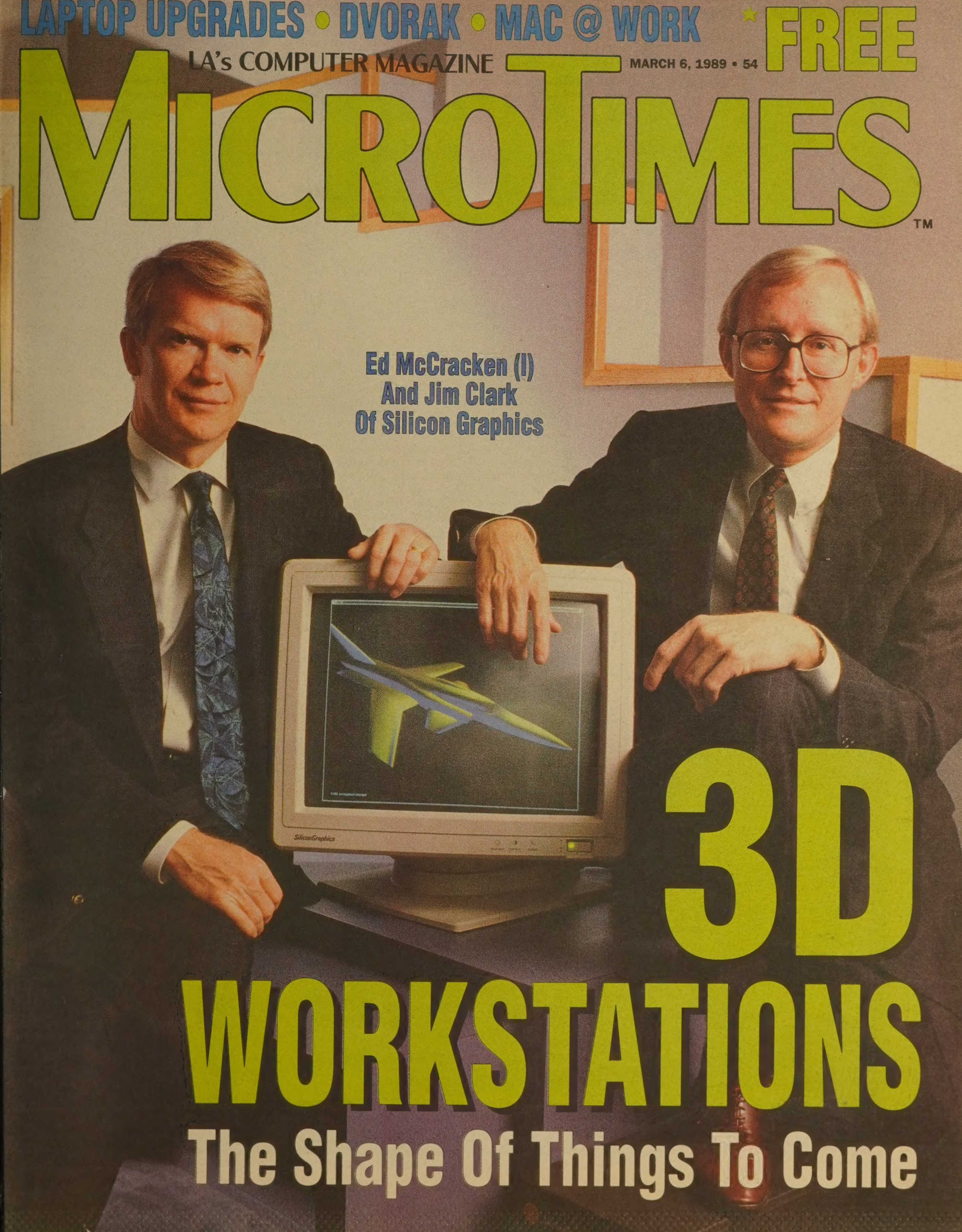

Ed McCracken (l)
And Jim Clark
Of Silicon Graphics

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MICROTIMES™

COVER STORY

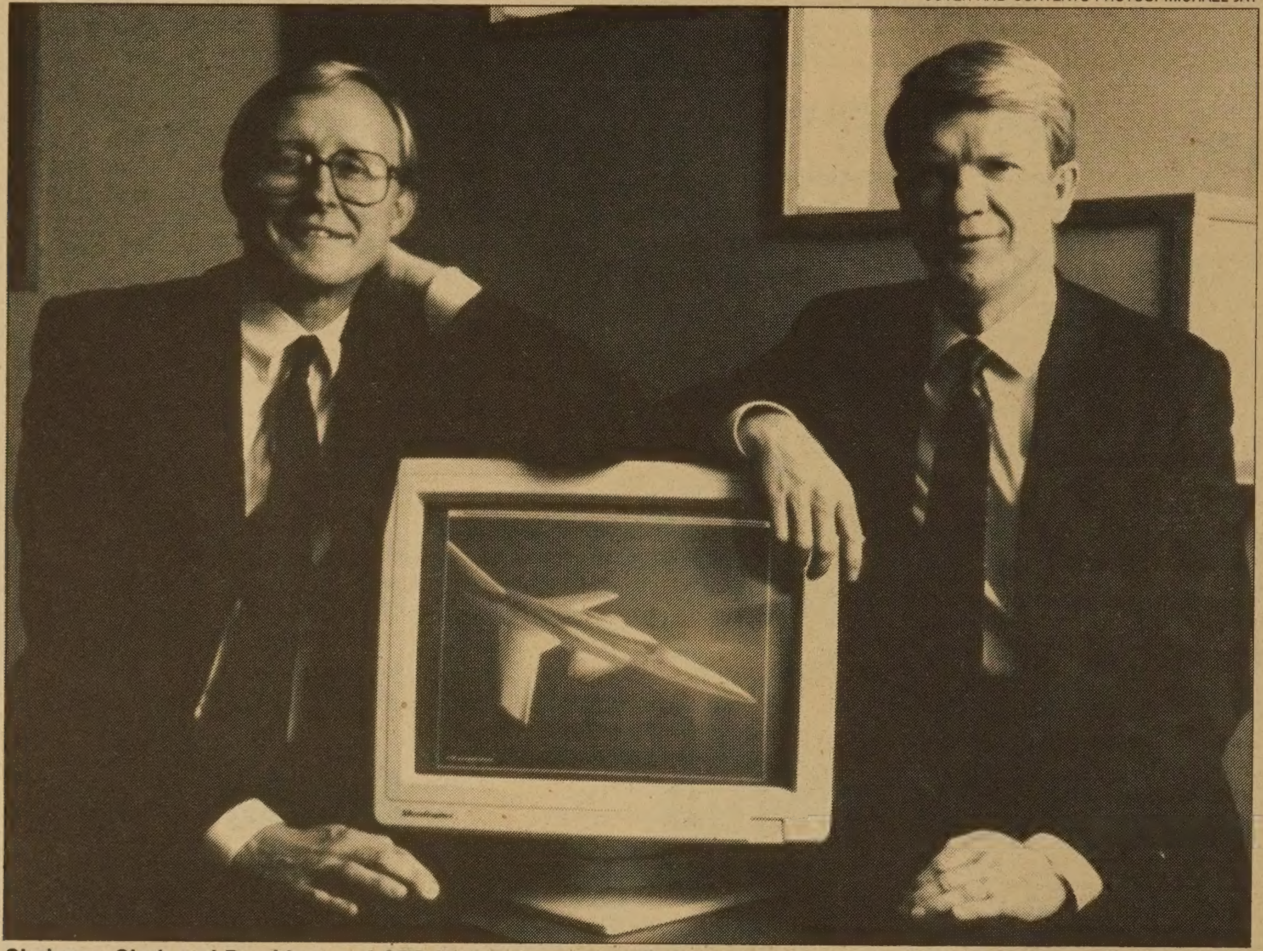
38

Silicon Graphics: New Leaders In 3D Graphics Workstations

By Mary Eisenhart

Jim Clark and Ed McCracken say they want Silicon Graphics to be the undisputed best in real-time 3D graphics and modeling workstations. With the company's UNIX-based machines now selling for about $15 thousand, their impressive RISC-based, user-friendly systems for graphic artists, engineers, architects, and scientists may revolutionize the world of 3D modeling.

COVER AND CONTENTS PHOTOS: MICHAEL JAY



Chairman Clark and President and CEO McCracken show off their stunning real-time 3D graphics machine.

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Getting More Power From Laptop Computers

By Wayne A. Yacco

An assortment of valuable tips for enhancing the capabilities of older laptops.

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Amiga

By Matthew Leeds

Aegis produces a digital sampling system that's good fun and a valuable tool.

Mac @ Work

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Mac Accounting With Strictly Business

By David R. Satava

No frills, no thrills, just a business accounting package that does what it's supposed to.

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Mac-PC Connectivity

By Robert Beauchamp

FoxBASE+ sets a high standard for Mac to PC connectivity.

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Realizable Fantasies

By Jim Warren

Power backups for computers, freedom of communication for oppressed peoples, a PET subject, and a plea for venture capitalist info.

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Dvorak's Last Column

By John C. Dvorak

Revealing the contents of the "IN" basket.

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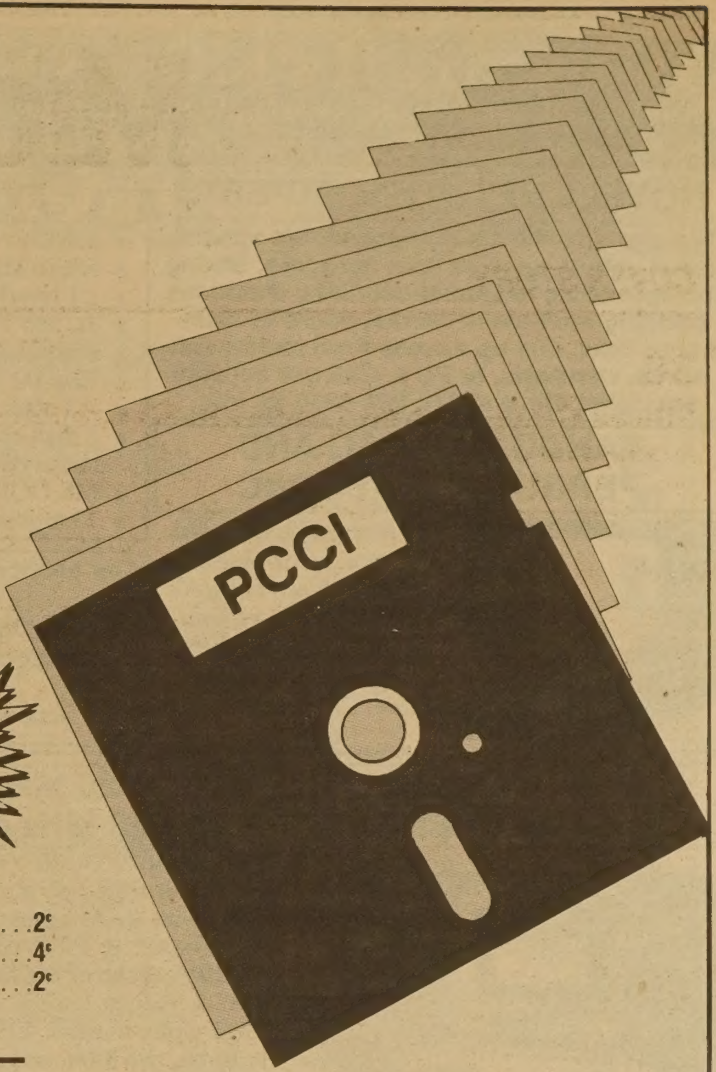

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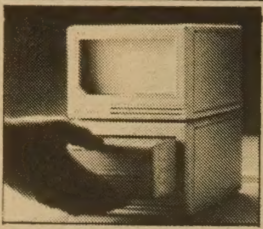

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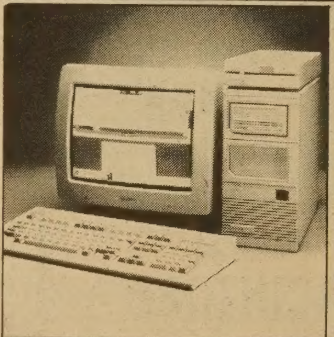

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March 6–9 Folio:West—The 1989 Publishing Conference. Los Angeles. Hanson Publishing Group. Call: (203) 358-9900.

March 7-10 Systems Engineering For Integrated Hardware/Software Applications Course. Los Angeles. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

March 7-10 Project Management: Planning, Scheduling, Tracking & Controlling Course. Los Angeles. Integrated Computer Systems. Call: 1-800-421-8166.

March 7-10 Microprocessor Software, Hardware & Interfacing Hands-On Introduction. Los Angeles. Integrated Computer Systems. Call: 1-800-421-8166.

March 11 Shop Till Ya Drop Computer Swap. Glendale. Microshows. Call: 1-800-433-7469.

March 11 Computer Show and Sale. Pasadena,East-West Computer Shows. Call: (415) 388-8893.

March 12 Computer Show and Sale. Lancaster. East-West Computer Shows. Call: (415) 388-8893.

March 13-15 New Technologies: Building On The Fourth Wave Seminar. San Francisco. Seybold Seminars. Call: Kevin Howard, (213) 457-5850.

March 13–15 Novell System Manager Course. Santa Ana. New Horizons Computer Learning Center. Call: James Nakakihara, (714) 556-1220.

February 13 Understanding Computers Seminar. San Diego. Padgett Thompson. Call: 1-800-255-4141.

March 14-17 Microprocessor Troubleshooting: Hands-On Tools & Techniques Course. Los Angeles. Integrated Computer Systems. Call: 1-800 421-8166.

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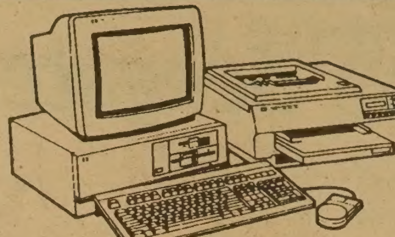

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March 16 A Broader View—Where The Software Industry Is Going. Palo Alto. Software Entrepreneurs Forum. Call: (415) 854-7219.

March 17–19 The 14th West Coast Computer Faire. San Francisco. The Interface Group, Inc. Call: (617) 449-6600.

March 18 Computer Marketplace. Los Angeles. RK Productions. Call: 1-800-252-7927

March 25 Computer Marketplace. Long Beach. RK Productions. Call: 1-800-252-7927

March 28-31 Effective Skills For Technical Managers Course. Los Angeles. Integrated Computer Systems. Call: 1-800-421-8166.

March 28-31 Digital Control Systems: Design Techniques & Tools. Los Angeles. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

March 28-30 Fourth International Conference On CD-ROM. Anaheim. Microsoft. Call: (206) 325-5702

March 29-31 Software Quality Assurance & Testing Course. San Diego. Integrated Computer Systems. Call: 1-800-421-8166.

March 29–31 Third Annual Parallel Processing Symposium. Fullerton. The Computer Society Of The IEEE. Call: (714) 738-3414.

March 30-31 Western Educational Computing Workshops. UC, Santa Cruz. California Educational Computing Consortium. Call: (415) 338-1212.

March 30—31 UNIX & Open Systems Futures: The Impact On Software Strategies. Los Angeles. Digital Consulting, Inc. Call: (508) 470-3880

March 31—April 2 National Apple User Group Conference. Indianapolis. Apple Pickers, Inc. Call: (317) 291-4042.

April 1 Computer Marketplace. Costa Mesa. RK Productions. Call: 1-800-252-7927

April 1 Shop Till Ya Drop Computer Swap. Riverside. Microshows. Call: 1-800-433-7469.

April 4—6 Third Annual ESD/SMI Expert Systems Conference And Exposition. Detroit, MI ESD. Call: 1-800-457-9504.

April 5-7 Software Maintenance Course. San Diego. Integrated Computer Systems. Call: 1-800-421-8166.

April 5-7 Micro–Mainframe Connectivity: Practical Linking Tools & Techniques Course. Los Angeles. Integrated Computer Systems. Call: John Valenti, 1-800-421-8166.

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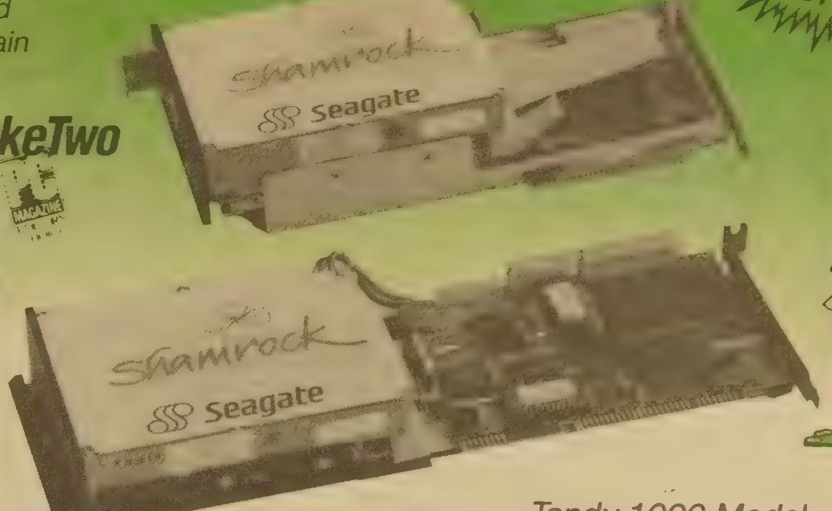

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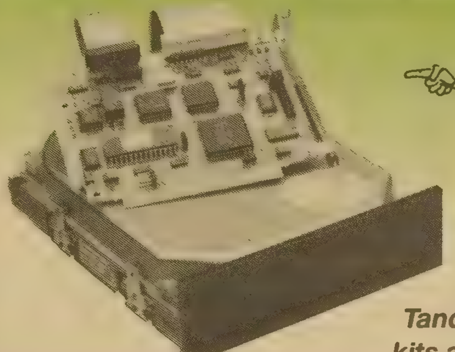

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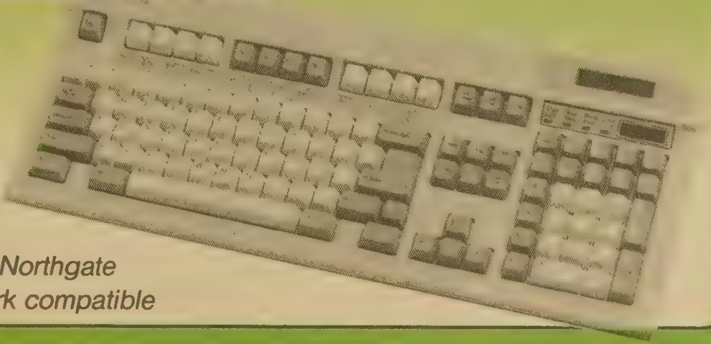

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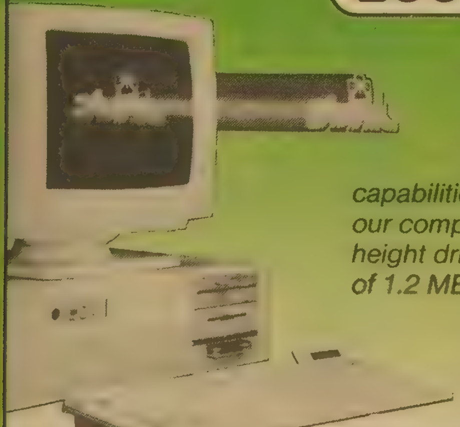

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April 6 2nd Annual Mendocino County "Technology In The Redwoods." Ukiah. CUE. Call: Ken Hewitt, (707) 463-5224 or 468-5894.

April 8 Computer Show and Sale. Pasadena. East-West Computer Shows. Call: (415) 388-8893.

April 8 Computer Marketplace. Ventura. RK Productions. Call: 1-800-252-7927

April 9 Computer Show and Sale. San Diego. East-West Computer Shows. Call: (415) 388-8893.

April 10-14 Hong Kong International Computer Conference. Hong Kong. American Federation of Information Processing Societies, Committee on Science and Technology. Call: (312) 299-4227 or 299-4270.

April 10-13 MACdex/Spring (The Distribution Trade Show For Macintosh-Related Products And Services). Chicago. The Interface Group. Call: (617) 449-6600.

April 14 Disk Operating System Meeting. Irvine. American Management Association. Call: (212) 903-7936.

April 14 & 21 Professional Publishing With PageMaker. Santa Ana. New Horizons Computer Learning Center. Call: Rana Murashige, (714) 556-1220.

April 18-20 Connect '89, The Technical Conference And Exposition For MIS/Communications Professionals. Boston World Trade Center. Hill and Knowlton. Call: (617) 330-7630.

April 26–28 Dataquest's 1989 Computer Storage Conference. Santa Clara. Dataquest. Call: 1-800-624-3282.

April 28 Computer Marketplace. Pomona. RK Productions. Call: 1-800-252-7927

May 1–3 Physical Design Workshop: Module Generation & Silicon Compilation. Newport Beach. The Computer Society Of The IEEE. Call: (415) 494-4845.

May 7—8 Third Computer Game Developers' Conference. San Jose. Call: (408) 738-4888.

May 9-10 EuroBus '89—Germany. Muenchen Sheraton, Munich. MultiDynamics, Inc. Call: Anne Weber, (714) 669-1201.

May 13 Computer Marketplace. Costa Mesa. RK Productions. Call: 1-800-252-7927

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News about user group meetings and other regularly scheduled activities should be sent to User Group Network at the same address.

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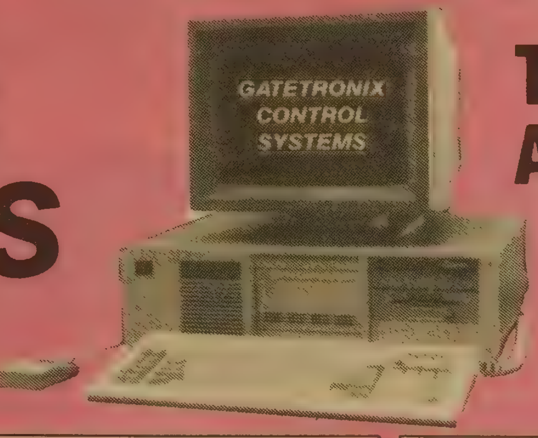

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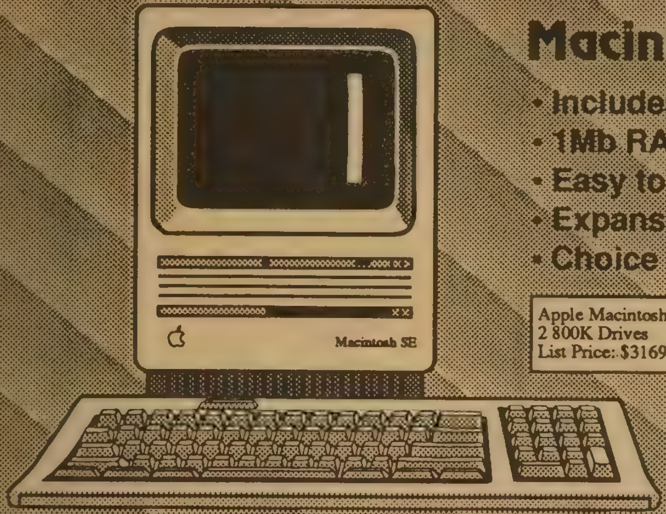

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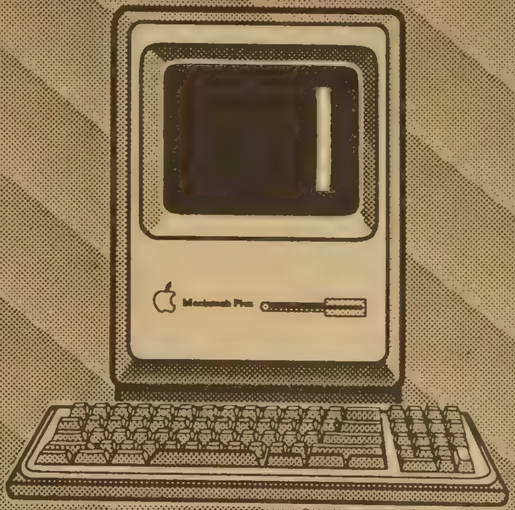

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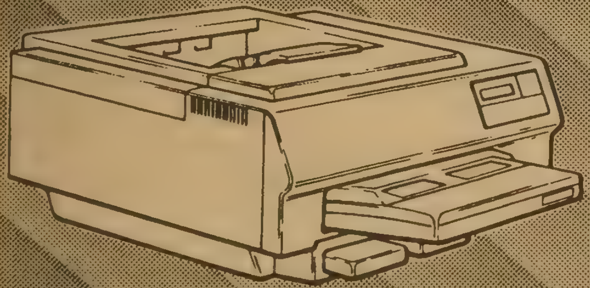

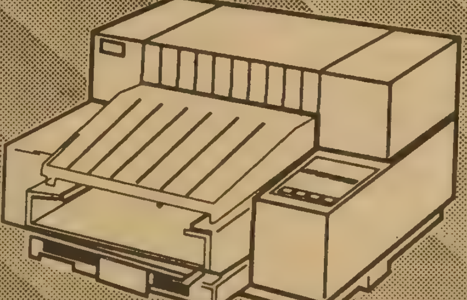

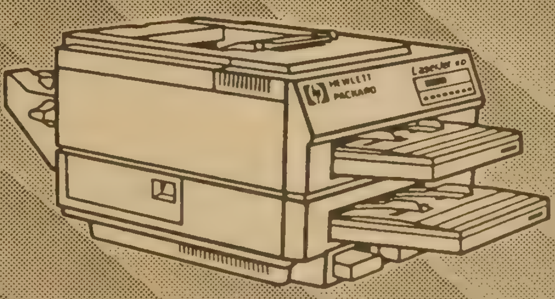

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LETTERS

The MicroTimes 100—A Cautionary Tale

I just finished reading your Mid-December issue of *MicroTimes.* I was very interested in your *MicroTimes* list of the "Industry's Most Influential Leaders." After reading this article it was apparent that you had made a large mistake in omitting one company, Hewlett-Packard.

Your mistake was so obvious and glaring I felt I had to write you a letter. You had CEOs from IBM, DEC, and Apple in your list, but not H-P. H-P is one of the first companies in the Valley, they are one of the most successful companies in the industry, they are one of the best-run companies in the country, and one of the largest computer employers in the Bay Area.

Ask all the people on your 100 list who they think are the "fathers" of the industry, and I bet Bill [Hewlett] and Dave [Packard] would be at the top of the list. Look through your own magazine and see how often H-P is mentioned or their products are advertised. Think of all the engineers at computer companies that use their equipment.

David Packard is not influential? He is one of the wealthiest men in the country. He was Under Secretary of Defense, just won the Presidential Medal of Freedom, and has been a leader in philanthropy. The list of committees he has headed and awards he has won would fill your magazine. Oh well, enough said.

How about Bill Hewlett or John Young? They both are very influential. When I see some of the people who made your list I have to laugh. Ten years from now nobody will remember them.

Ralph Seaton
Soquel

Mr. Seaton has a point, and we certainly didn't intend to slight Hewlett-Packard, a company whose excellent reputation speaks for itself. Unfortunately, this is the kind of letter we wish we got before we compiled our list, because it is the literal truth that none of the readers who sent in ballots for the MicroTimes 100 mentioned a single H-P employee. Not even Judge Robert Aguilar's son whose belatedly-discovered employment at H-P temporarily derailed the Apple/H-P/Microsoft look-and-feel suit...

Gentle readers, if there's somebody you think should be on the list, don't be shy. ***Tell us.*** *You don't even have to wait for the official ballot. We really want to know what you think.*

As for the fleeting nature of some nominees' fame, the list, being annual, is not intended as a lifetime achievement award. Rather, it honors those who have made contributions to the micro industry during the calendar year in question. True, some of them may well be forgotten ten years hence; this does not diminish the significance of their current achievement.

After all, not too many people remember who the architects of the Altair were, but where would we be without them?

Fear And Loathing Redux

The January issue is a gem! My first editor told me that a journalist only has two duties: tell the truth and raise hell. *MicroTimes* performed very well on both counts. Jim Warren raised a lot of questions that should be raised about products that should be available but are not. John Dvorak was, as usual, a curmudgeon and gave the software giants a bad time. I agree with him: I just don't want to be near his car when he starts it in the morning.

My real favorite was "Fear and Loathing at COMDEX." The Reverend John [Perry Barlow] really said what was on my mind. My wife will be forever grateful since I've been ranting about this for a long time.

My only negative comment about his article is that after a paragraph of good, clean, declarative sentences, he likes to drop in a four-syllable jaw breaker or obscure reference. However, I did like the reference to executives as "Bizdroids." Reading his article was a bit like jogging through the mountains: you keep one eye on the beauty of it all, and one eye out for rattlesnakes and doggy-doo.

Aldo S. Panzieri
Alhambra

I can't think when I have been more entertained by a piece of computer-related prose as while reading "Fear and Loathing at COMDEX" by The Most Reverend John Perry Barlow. But however much I am willing to allow the Rev. Barlow to amuse me with his genius for bombast and metaphor, I am not quite so ready to agree with his point of view.

Rev. Barlow (I'll continue to use his official title to avoid having my system destroyed by a divine power surge) does indeed take on the color of a Hunter Thompson clone. In fact I am very much reminded of my own immature attitudes toward the so-called establishment during the late great sixties. I hope I don't have to remind a theological scholar that it is the sameness in superficialities such as dress and manners that frames the contrast for the vast differences in human personality and creativity. Seminaries and monasteries demand a similar kind of discipline to encourage rational thought and, it is hoped, spiritual awakening.

If it comes to making choices on the basis of "sparkles of interest," I will have to side with my fellow productivity drones (who actually understand how things work) over the scruffy disheveled airheads, who strive, mouse in hand, for utopia. If Rev. Barlow is nostalgic for the Merry Pranksters, perhaps he should take up as a DP consultant for some Rumanian traveling show.

Admittedly Las Vegas is a hellhole that resembles the underside of something rotten exposed to the light of day. It baffles me why anyone could find the place in any way interesting. Perhaps a change of venue for COMDEX to one of the more scenic cities of the west would lead to a more congenial atmosphere.

Pray for surf.

Bill Copenhaven
Richmond

It's hard to know where to begin concerning Mr. Barlow's polemic on COMDEX. We'll begin with the positive points. First of all, Barlow is correct about American technological innovations being ignored in this country, only to be taken up by the Japanese. This is a valid point, which really needs to be addressed in our industry.

He is also correct concerning the bureaucratization of the computer industry. However, the fact that he is shocked at this reveals just how naive he is. What planet has he been living on? The fact that he touches briefly on valid issues makes it even more disappointing when he launches off on a ferocious left-wing tirade for the remainder of his piece. Honestly now, are the "consequences of free expression" the same in America as they are in the Soviet Union, e.g. "disenfranchisement and loss of economic security"? When this self-styled "reverend" is a living contradiction of this foolish assertion: a lyricist for the Grateful Dead? Give me a break. I'd like to see him try his little games in Moscow, glasnost or not.

Mr. Barlow's piece is entirely negative in its tone, and embodies, as such, the leftist mentality. Why not a candle instead of cursing the darkness? Also, while we're at it, why not stick to the subject at hand instead of declaiming hysterically about how America is becoming a totalitarian nation?

Buddy, it looks to me like Barlow's not doing the right drugs!

Rich Grace
Huntington Beach

Barlow replies: What a great letter. Mr. Grace may have more in common with me than he thinks. I suspect we are both techno-cranks, a commonality which transcends the ideological issues to which he refers.

Even in those matters, the gap probably isn't so wide. I haven't been called a leftist since that pleasant August evening 20 years ago when I rode my motorcycle into Czechoslovakia while Soviet tanks entered from the opposite border. They rolled right over the little flowers of my collegiate Marxism.

So, while I may have been working for the Grateful Dead (an entirely apolitical institution, by the way), I was, not so long ago, the Republican County Chairman of Sublette County, Wyoming, a region about as conservative as any non-Islamic place has been since the Middle Ages.

But I will stick by my final assertions. Those who work in corporate America are forsaking liberties of thought, speech and action to a larger extent than most of them know. This process is the more insidious for its subtlety. Company people buy in gradually until they uncritically allow the purposes of "our company" to become their own. In that sense, we are talking about totalitarianism in the most precise sense—an oppression so complete that the oppressed become the oppressors without even knowing it.

He's right about one thing: it's better to light a candle. However, since I am neither an engineer or a businessman, I can't light the the technological candles that will light the future. I can only point out the ones already burning. And I know when I've gone into an area of darkness. Like COMDEX.

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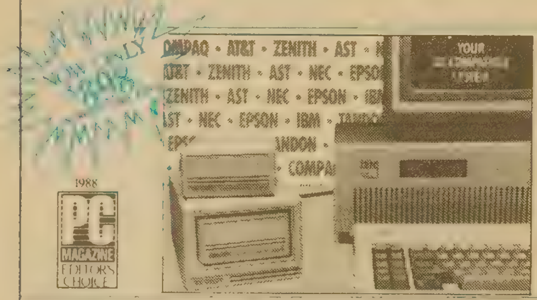
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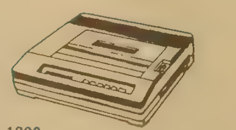

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LETTERS

And, oh yes...I don't take any drugs at all.

Re: Industry Issues By Rev. John Perry Barlow
Fear And Loathing at COMDEX—January 23, 1989

Dear Editor:
Funny, funny, funny. More, more, more.

Jason Alexander
San Francisco

The article "Fear And Loathing At COMDEX" by Rev. John Perry Barlow was the most outrageous and informative piece I have read recently in any publication. I greatly hope that you will have this gentleman as a frequent contributor. You would be advised to issue a disclaimer at the heading of anything he might write, however. This man names names and stomps on toes.

I would probably not have written, since I have always expected excellence of *MicroTimes*, especially given the price I pay for it, except that there was an editing or typographical error in the IBM section. The *son et lumière* requires an accent grave rather the accent as printed. My suggestion is that you simply omit the accents when you feel compelled to fly off into other languages. It seems to me that you look ridiculous when you attempt French (or whatever else you may have pretensions to) and get it wrong.

As a reader and buyer for your advertisers, I am pleased that you are concerned with the entertainment aspect of microcomputers as well as the technical. As for the error, I am certain it was a typo or a machine malfunctiôn, but I still could not let it pass. It annoys me when others begin to be as pretentious as *moi-même.*

Jack Eason
Santa Cruz

Foreign Characters: The Plot Thickens

In reference to your article in the mid-December issue of *MicroTimes* [in User Group Network, asking help in getting foreign-language diacritical marks properly placed on screen and paper], I have had some (bad) experiences trying to write in the Spanish language.

First, I am using an Epson Equity I clone with Epson LX-80 printer. I have had this setup going on three years. I have spent most of this time trying to write (on paper) in Spanish, since I have been studying the language.

From my experience placing the tilde is the least of the problem, but I am not using a Macintosh. The problem most probably is in the printer. About half of the Epson printers cannot print international characters. My particular printer uses the special ASCII decimal codes (for international characters) to print italics instead. Therefore it is impossible to print anything using these decimal codes.

I have used at various times *WordPerfect* 4.2, *Volkswriter III*, and *PC-Write.* All of them put correct text on the screen, and I am sure that [if I were] using an appropriate printer, it would print it on paper. But mine doesn't.

PC-Write, but not the other word processing programs, will back-space without erasing by using the ACCENT key (the one with the double parenthesis which looks like a backward apostrophe and the tilde on it). This makes it very simple to write and print the tilde. The real and important problem is how to put the accent mark on the vowels.

The documentation for the printer provides that you can use the accent key and then the apostrophe to get a mark over the vowels. This system works, but it is really not satisfactory. The screen looks like a smudge. Of course there is other punctuation. To get the exclamation and question marks Epson gives a one-line program in BASIC to set the DIP switches for several international languages. They can also be set by hand:

¡María! ¿Qué pasó esta mañana?

Robert S. Walker
Woodside

Gee, we thought Mac users had problems with this...

As it turns out, the Mac handles all this very well in its native state. Mostly through little-known uses of the Option key in combination with other characters. Arthur Naiman's Macintosh Bible *contains an excellent discussion of the problem and a list of keystrokes required to produce the desired characters. The book is recommended with wild enthusiasm.—eds.*

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NEWS
AND ANALYSIS

BY PAUL HOFFMAN

Intel Loses Copyright To 8086 And 8088 Microcode Due To Negligence

NEC Exonerated In Copying Charge

In a stunning defeat for Intel, US District Court Judge William P. Gray decided that Intel had lost the copyright on the microcode to the 8086 and 8088 CPU chips since it had not maintained a good-faith effort keep the copyright. Further, he ruled that even if the copyrights were valid, NEC had not violated them in its V series CPUs. The ruling will give NEC's chips a large boost, since customers do not need to worry about legal ramifications of their use. NEC has been plagued with low sales of the V series relative to Intel's chips, even though the V series runs faster and has wider capabilities.

The lawsuit, which has taken many years to be heard and decided, sets a strong precedent for chip makers. It clearly defines what can and cannot be done to protect microcode. Microcode is the design of the circuitry in a chip, somewhat like a complex roadmap of where the electrical impulses will go and what they will do in particular circumstances. Gray ruled that it is all right to copy from a competitor's microcode, but not to copy it exactly. This conforms to the rulings that have been made on copyright in other areas such as books and films. NEC had looked at Intel's microcode (through an arrangement with Intel under which NEC was producing Intel's chips to help widen the market), but had made improvements on the microcode and changed it in many places. Gray ruled that since NEC had obtained the copy legally and the microcode in the V series chips was in fact different in many areas, the chips did not violate any microcode copyright.

NEC argued successfully that for one chip to compete successfully directly against another, the competitor had to have the same functionality with possible improvements (this is very similar to the arguments that Paperback Software and Mosaic are making in the defense of their suit by Lotus). Gray agreed, noting that the Copyright Code was never intended to prevent people from making better replacements as long as the replacements used a significant amount of creativity. The NEC chips were designed to perform just like the Intel chips, only faster and with a few extra features. In order to do that, NEC claimed, certain portions of the microcode would by nature look extremely similar. NEC backed up this claim by creating a second set of 8088 microcode, this time in a "clean-room" environment, meaning that the person creating the microcode never had access to Intel's microcode. The results were that the clean-room code also had many sets of instructions that were similar to the Intel code. NEC said that this proved that small sections of code could arise from actions other than copying, and Gray agreed.

The ruling noted that there is a large difference between the copyright on the microcode and patents that either side owned that might pertain to the chips. The distinction is important because many chip manufacturers own many patents that pertain to various chips. It is common industry practice among the large chip manufacturers to have blanket patent cross-license agreements, as was the case between Intel and NEC. This means that someone who had not cross-licensed Intel's patents could probably not have made compatible chips without violating some patents. In fact, companies who are now creating clones of other Intel chips may run up against those patents if Intel does not agree to license them.

The case stems originally from Intel's marketing of its CPU chips. Before IBM had chosen the 8088 for its first generation of PCs, Intel had no assurances that the 8088 and 8086 would become popular in the market. At the time (late 1970s), if you were a chip manufacturer, the common practice in the chip industry was for you to get other manufacturers to also make the chips that you had designed and were producing. This is called "second sourcing" the chips, and gives potential clients some assurances that, if you go out of business or have to shut down your chip-making facilities, someone else is already making the chips and they could therefore stay stocked. Intel made many such second source deals for the 8088 and 8086 with other chip manufacturers, and this was one of the reasons that IBM felt secure in using the 8088 for its first personal computer.

It is also standard industry practice to cross-license patents when a second source agreement is made. This is to prevent either company from claiming that the other is infringing on a patent and therefore stop the other one from producing chips that have since become popular. Intel and NEC had such a blanket cross-licensing agreement when NEC started producing 8088 and 8086 chips in 1980.

IN THE NEWS . . .

20

Intel Loses Copyright To 8086 And 8088 Microcode Due To Negligence

Intel said they were out to prove that microcode was copyrightable—the judge said they were right, but they lost their by not requiring companies to put Intel copyright statements on chips they second-sourced to them.

22

US Charges Japan With Disk Dumping

Look forward to higher 3.5" disk prices now that the US Commerce Department has ruled that Japanese companies have been selling disks at unfairly low prices.

24

Atari Sues Nintendo

Atari Corporation is accusing Nintendo of monopolistic behavior by preventing game developers from porting their Nintendo games to other computers.

26

Communications And The Small Business User

First it was networking. Now the latest marketing buzzword is fax-in-your-computer, but the actual benefits of this new technology may be highly overrated.

Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on USENET (phoffman@well) and MCI Mail (264-3171). He also writes popular microcomputer books.

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NEWS AND ANALYSIS

According to the NEC complaint, Intel decided in 1982 that it wanted to change the contracts for its second sources and demanded a new royalty structure. NEC decided not to rely on Intel and designed its own processors that it thought the market would want. Instead of just second sourcing the Intel processors, NEC wanted to market processors that would act just like Intel processors but be faster and have a few extra goodies in them. Thus, NEC created the V series by looking at the microcode that Intel had given them as a second sourcing agent and creating their own microcode from it. In fact, the first two processors that NEC produced could directly replace Intel's CPUs in personal computers. Intel began making threats in public about the legitimacy of the code in the V series, and sales never took off. Intel and NEC settled the dispute in 1983 over patents, but Intel then turned around and threatened to sue over copyright. In 1984, NEC sued Intel to prove that it had not infringed on Intel's copyrights (since the patent cross-license was clear).

The case was heard by Judge William A. Ingram, but he disqualified himself just as he was about to rule because it turned out that he had a tiny amount of Intel stock through a stock club of which he was a member. The case was then heard before Judge Gray and all evidence and motions were heard by late last July. The ruling has three parts:

Microcode is copyrightable—this was widely expected, since microcode is to chips what object code is to computer programs. It has been well established in the courts that object code can be copyrighted, so this came as no surprise. Although NEC had made the argument that microcode should not be copyrightable, most lawyers observing the case felt that this was just legal positioning and not something that NEC as a company took very seriously.

NEC did not infringe on Intel's microcode copyright—Just as two books can have very similar plots and characters without any infringement, two pieces of microcode can be very similar without any infringement. NEC showed that, in order to perform tasks like the 8088 or 8086, it had to produce microcode that performed certain tasks and that that process would inherently cause some of the microcode to be the same. It also showed where the microcode diverged, proved that those portions were significant and the product of the creative process, and showed that the overall microcode was different enough to distinguish the two easily. According to the decision, "expression of the ideas underlying the shorter, simpler microroutines may be protected only against virtually identical copying, and that NEC properly used the underlying ideas without virtually identically copying their limited expression."

Intel did not protect its microcode copyright with proper notice, and therefore lost the copyright—Intel did not require that second source companies put its copyright statement on the chips. In fact, over three million chips (over 10 percent) went out without the copyright notice. Further, after it found out about the copyright problem, it did not move quickly to remedy the situation. Thus, it lost its copyright.

Judge Gray made it clear that this ruling was separate from the infringement ruling. If he had said that NEC didn't infringe because Intel had lost their copyright, Intel could have dragged the appeals process on for at least five years by first appealing the loss of copyright, forcing NEC to then have to appeal the infringement. As it stands, even if Intel can overturn the copyright loss, it has to appeal the infringement ruling separately.

When Intel lost the case, they pretended that they won. They crowed, "All we really wanted to prove was that microcode was copyrightable and we did it." Unfortunately, many newspapers believed them and some even ran headlines indicating that Intel had won the case or that it was a 50/50 split. Few lawyers would agree that losing the copyright to two strategic chips and failing to show infringement could be considered any kind of win, especially when most people took it for granted that Judge Gray would rule that microcode was copyrightable based on his rulings on pre-trial motions.

Intel's general counsel said that "We now have a precedent that our large investment in new products can be protected under copyright laws." If Intel really believes that this is the case, they will have a hard time appealing the decision without tearing it apart. If they try to appeal only one part of the ruling, the appeals judge will look skeptically on Intel's reasoning on why part of the judgment was superb and the rest wrong. Nothing in Gray's ruling indicates that that case was a draw; in fact, he is especially critical of Intel's ability to protect its copyrights.

NEC has to do some thinking in the next few months about how it wants to proceed. Now that they have won the case, they need to decide what to do about damages. In litigation costs alone, the case has cost them millions of dollars. Intel's public statements about the impropriety of the V series chips have clearly caused NEC tens of millions of dollars in lost orders. NEC has shown restraint throughout the trial, keeping its rhetoric against Intel fairly low-key, especially compared to what Intel has said about NEC. If NEC sues for damages, it will take a long time and they will lose even more time on the part of their managers in depositions and testimony; if they don't sue, they may be turning their back on a huge sum of money. At press time, lawyers for both sides said that they are still considering what to do next, and NEC indicated that it would take them a fair amount of time to figure out how much they had been damaged by Intel's claims and the value of what they had lost in preparing the court case.

Other questions also arise out of the case. *Microprocessor Report*, the CPU industry newsletter based in Palo Alto, notes that "Intel is believed also to have allowed 80186/188 and 80286 alternate source manufacturers to produce chips without requiring that they mark them with Intel's copyright notice. As a result, it is possible that one of these

US Charges Japan With Disk Dumping

The US Commerce Department has ruled that Japanese producers of 3.5" disks have been dumping them in the US at unfairly low prices, and it will probably levy a 30-50% tariff on them in the next few months. This, of course, will significantly raise the price of 3.5" disks from Japan. The companies involved include Sony, Hitachi/Maxell, Fuji, and other smaller manufacturers. The original dumping charges were brought by Verbatim, which now manufactures its 3.5" disks in Mexico. Already, the companies in question have had to post bonds equal to the margins that the Commerce Department charges they were undercharging by.

The "unfair prices" claim is based on a finding that the disks sell for less in the United States than they do in Japan. Based on this, the Commerce Department decided that US manufacturers were being materially injured by the Japanese imports. The demand for 3.5" disks is higher in the US than it is in Japan because of the larger number of computers that use them and the fact that American business people use more diskettes per computer than the Japanese.

Japanese companies hold about two-thirds of the US market, and are especially strong in the bulk market (such as software manufacturers and mass duplicators) because the quality of American-made disks is significantly lower than that of Japanese-made disks. The ruling did not take into account the quality difference in diskettes or the fluctuating prices offered both here and in Japan based on offers to get customers to switch between brands.

The 3.5" disk is becoming more popular due to its increased use on the IBM PS/2 and new clones, and it has been used on the Macintosh for over five years. If the Commerce Department raises the prices on Japanese imports by the expected 45%, average retail price for the diskettes will probably also rise by that much, since American manufacturers have traditionally raised prices to match foreign competitors when tariffs were added. Already, many bulk diskette users are hoarding in anticipation of this steep price jump, and many corporate buyers have put in large orders to help buffer the price hike.

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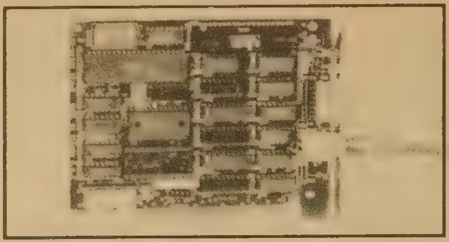

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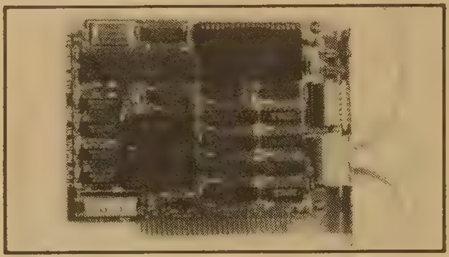

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NEWS
AND ANALYSIS

manufacturers (such as Harris or AMD) will challenge Intel's copyright on the 186/188 or 286 microcode, using the NEC/Intel ruling as a precedent." Also, it is not clear who has blanket patent cross-licenses, and how extensive they really are. NEC could team up with another chip maker to extend the V series to be compatible with the 80286 and 80386 around the cross-license of one of these manufacturers. They may even be able to do it themselves. Intel will certainly object, but given how poorly that they have treated their second sources, some may be willing to take the risk.

Atari Sues Nintendo

Nintendo's practice of preventing game manufacturers from developing games for other computers is a monopolistic action, according to Atari Corporation. In a recent suit, Atari Corporation says that it has essentially lost all of the home video game market to Nintendo due to the fact that people who develop games for Nintendo must wait two years before porting the games over to Atari's system.

Atari is not just making vague claims in its lawsuit. It quotes from Nintendo itself in Nintendo's suit against Atari Games (Atari Corporation and Atari Games are completely separate companies). In its suit against Atari Games, Nintendo says that its agreement with game developers forces those developers "to refrain from adapting or offering the licensed video game program for use in certain home video systems for a period of two years." Because of this, few game manufacturers have come out with new games for the Atari game system, and the lack of games has thus significantly hurt its sales. Atari Corporation says that it has lost over $250 million due to this.

Atari Games and its Tengen subsidiary amended its lawsuit against Nintendo, claiming both that Nintendo is using technology patented by Atari Games and that Nintendo is threatening retailers into not selling games made by Atari Games. The patent issue revolves around the method in which the games scroll on the screen. Atari says that this method is covered in its 1984 patent. The patent, number 4,445,114, is for the hardware and software which causes smooth scrolling of video displays.

The harassment issue comes from letters and phone calls that retailers have received from Nintendo representative about selling Atari Games cartridges for the Nintendo machine. Some retailers have felt pressured to drop the Atari Games cartridges in order to assure a supply of games from Nintendo. Atari says that this heavy-handed marketing is illegal and is costing Atari Games millions of dollars. Atari Game's suit charges Nintendo with:

•"Threatening the prosecution of lawsuits against third parties—under circumstances where Nintendo knew that such lawsuits would have no legal basis and/or had no intention of carrying out the threats—unless such third parties would stop

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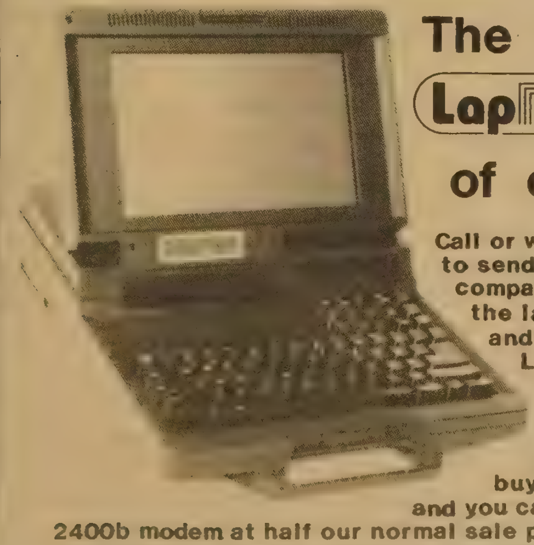

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NEWS AND ANALYSIS

selling the Atari/Tengen cartridges, return unsold inventory of the cartridges and refuse in the future to accept delivery of any cartridges,

•"Improperly and maliciously threatening distributors, retailers and the consuming public that product warranties that would otherwise apply to Nintendo video game machines would be rendered ineffectual upon the use of Tengen and Atari products, and,

•"Otherwise wrongfully and maliciously threatening dire economic consequences to entities that would do or would continue to do business with Tengen and Atari."

This suit follows on Atari Games's suit in December charging that Nintendo was illegally keeping competitors out of the market by controlling the manufacture and distribution of the game cartridges that work with the Nintendo machine. Later, the Software Publishers Association (SPA) has supported Atari Games's claim and says that the Japanese giant has caused the shortage of cartridges that plagued many retailers this Christmas. Nintendo then sued Atari Games for breach of contract, unfair competition, trademark infringement, and violating the Racketeer Influenced and Corrupt Organizations (RICO) Act, based on Atari Games putting out their own games that work with the Nintendo system without Nintendo's permission. Nintendo had sued Atari Games because Atari Games had reverse-engineered the copy protection scheme in the Nintendo game controller and began to sell cartridges without Nintendo's permission.

Communications And The Small Business User

1989 is supposed to be the year of the network (yet again), the year of really useful electronic mail, and the year of fax-in-a-computer. It is not clear, however, if any of these will be true for the individual user. With their valiant attempts to keep the almost-mythical Fortune 500 happy, the software and peripheral industries have ignored or barely noticed that the majority of computers which are used heavily are in the hands of small businesses. These are the people buying much of the innovative software (as compared to mindlessly buying *1-2-3* or *dBASE* because they were told to) and most of the interesting peripherals. But for these people, most of the advances that are promised for this year will be of almost no interest.

A few years ago, the computer industry realized that they were not enticing new people to buy computers just by touting power and efficiency. Apple was probably the first to see this and started buzzword marketing. The most effective buzzwords, Apple thought, were ones that were invented by the company, so that none of their competitors could hop on their bandwagon too quickly. Thus, "desktop publishing" was born. By the time other companies took this phenomenon

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1.2 MB F.D.D.	1.2 MB F.D.D.	1.2 MB F.D.D.	1.2 MB F.D.D.
1.44 3 1/2' F.D.D.	1.44 3 1/2' F.D.D.	1.44 3 1/2' F.D.D.	1.44 3 1/2' F.D.D.
Serial/Para./Game	Serial/Para./Game	Serial/Para./Game	Serial/Para./Game
CLK/CLDR	CLK/CLDR	CLK/CLDR	CLK/CLDR
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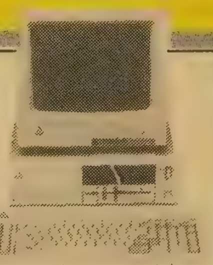

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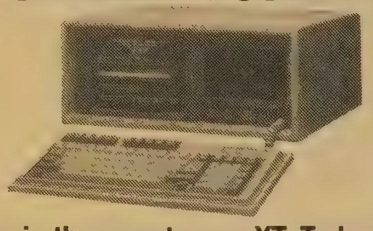

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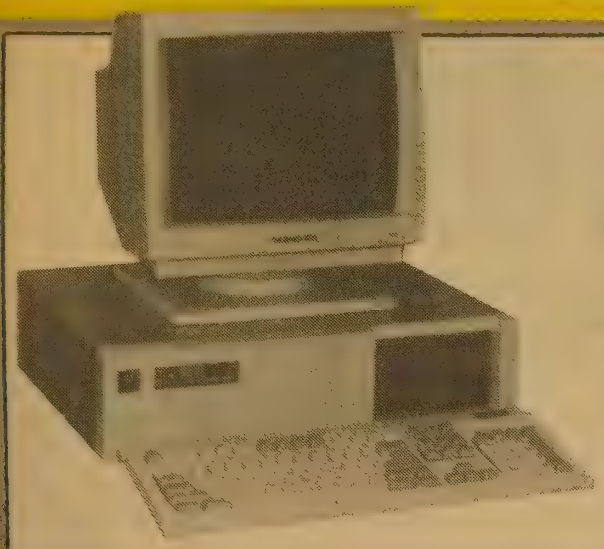

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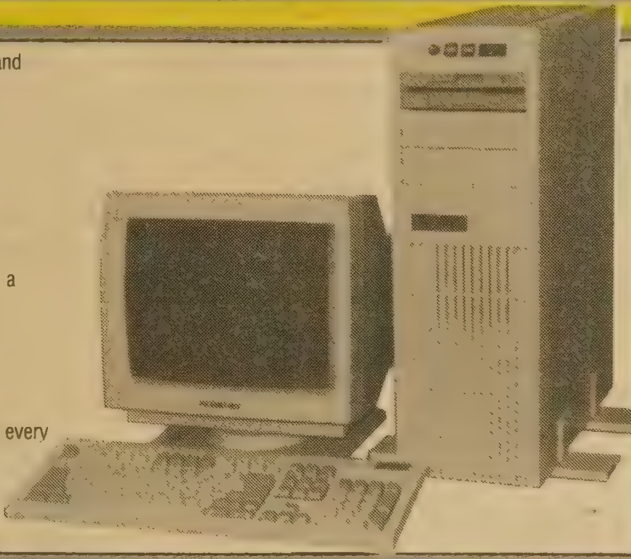

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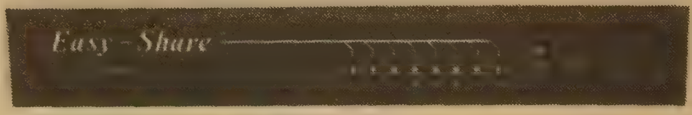

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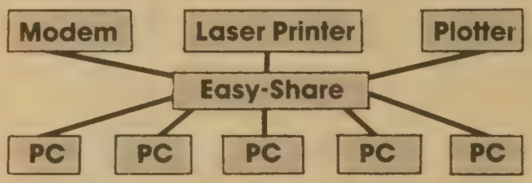

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NEWS
AND ANALYSIS

seriously, Apple had gotten quite a large piece of the pie. So other manufacturers started their own buzzword marketing, with mixed results.

"Networking" has been one of the most praised buzzword markets for microcomputers because it is easy to get into and, hey, all the mainframe and minicomputer people do it all the time. The networking marketing craze took hold in 1985 and continues unabated. However, the plethora of networking systems confused and scared many people away from buying a network, and many of these people noticed that they were doing just fine without networks.

Small companies with under five computers are rarely networked. The reasons for this vary, but they mostly come down to the small improvement in efficiency versus the high cost (for hardware, cabling, and software) and high maintenance associated with networks. More than half of all companies with a few computers use the "sneakernet" approach: put the information you want to share on a floppy and walk down the hall with it. In companies with large files, many have put tape backup systems in each computer and are carrying tapes around the office. With internal tape backup systems retailing for under $350, this method works well. Many small companies that do have networks forsake high speed whizzy systems for inexpensive, easy-to-cable, and easy-to-maintain systems like TOPS from Sun.

Electronic mail has been around for many years, longer than personal computers. It became popular in the last few years as a good method for people who have modems to communicate. However, most of the good electronic mail software that was released only worked if you were on a local network. Again, this excluded the majority of users since they weren't on a network. The short-sightedness of this approach is becoming apparent since none of the electronic mail software is achieving a perceptible presence in the market. Manufacturers of electronic mail software are being bought out and sold almost like a commodity.

The state of dial-in electronic mail such as MCI Mail and CompuServe is not much better. For some reason known only to the bureaucrats, there are no electronic mail services that have good or even reasonable user interfaces. Electronic mail is absolutely bewildering to many computer users, even the ones who have figured out how to navigate through the arcane command structures of popular software. Since most electronic mail services have only limited (if any) communications between services, you have to subscribe to at least three to be assured that the people with whom you want to communicate will be able to find you. To make matters worse, very few modem programs have addressed the interface problems to any depth.

So now we have this year's (or was it last year's?) new buzzword marketing plan: fax-in-your-computer. There are supposed to be three million fax machines in use in the US by the end of this year,

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which does not say much, since there are at least that many already in use in Japan, and they have half of our population. A fax machine in your office is a wonderful thing, as long as the people with whom you do business also have one. Basically, a fax machine lets you feed in sheets of paper, have them transmitted over the phone lines at quite high speed, and be printed on the receiving machine. They cut down on next-day delivery costs because you can get it there instantly for less money, and they cut down on telephone costs because you can write what you were going to say and send it by fax. A great example of people who use fax (and should use it more) are bookstores who have to order from dozens of publishers every week. Instead of requiring a person to stay on the line and read numbers and titles aloud, a simple fax from the bookstore to the publisher gets the order in with almost no sales time wasted on either end.

Some technoid saw this happening and thought, "Hey, now that we have scanners and great printing capabilities, why not take the guts of a fax machine and put it into a peripheral board inside a computer?" That seemed logical: you could easily teach programs that printed things out to "print" them to the fax board instead, drawings could be converted to fax images, and so on. A market was born. Products began appearing in 1988 and are promised to come on strong in 1989. The new era of fax communications via computers is upon us.

Or is it? One of the huge drawbacks to fax-in-your-computer is that your computer must be on 24 hours a day in order to receive incoming faxes. Few people leave their systems on all the time. Even those who do leave their systems on experience system failures (software and hardware crashes) during unattended hours. Also, many of the boards which supposedly work in the background put a huge drain on the process running in the foreground.

Given the amount of junk fax mail that is flowing through the ether these days (by some estimates, over 10% of all faxes are unwanted), that kind of system degradation may not be worth it. Most importantly, buying a fax peripheral for your computer means that you think that everything you want to fax will be generated in your system, and that everything you receive you want to view on the screen. This is rarely the case. If someone in your company types up a letter and wants it sent by fax, you're out of luck (unless you also own an expensive scanner). If someone sends you a 30-page memo by fax, you had better have lots of hard disk space.

This doesn't leave the small company in a very good position for communications. Until small networks become much cheaper and easier to use and until electronic mail becomes even close to as easy to use as the much-maligned USPS, most computers will still be islands. The situation does, however, leave lots of room for enterprising software companies who are willing to completely forsake the Fortune 500 to bring programs aimed only at small businesses to the market. ■

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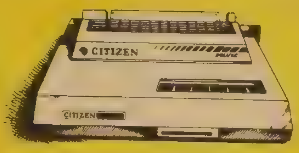

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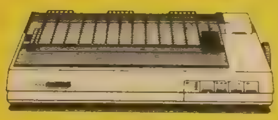

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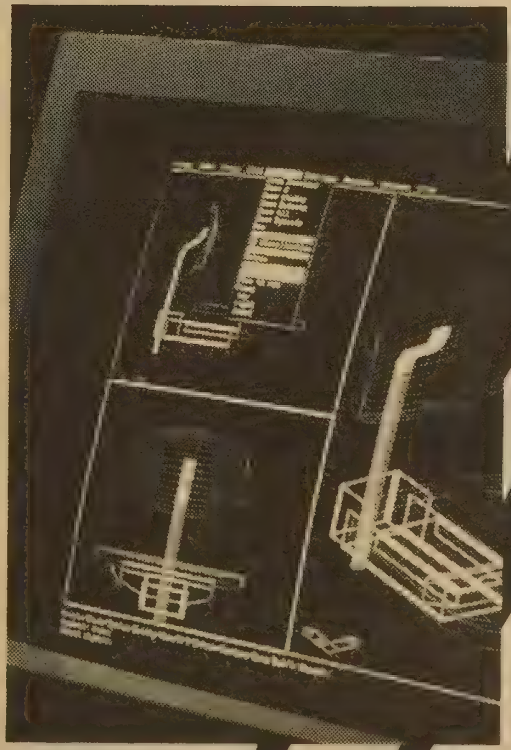

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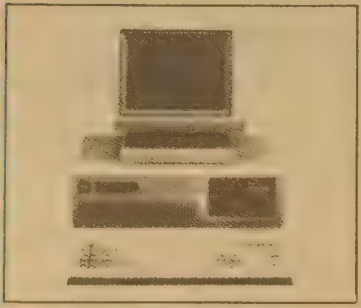

386 SYSTEM: $1799

- 16/8/4.77 MHz 0-wait 80386-16 motherboard
- 1 MB high speed static column RAM installed
- Expandable to 10 MB
- Award/Phoenix 386 BIOS
- 1.2 MB floppy disk drive
- Hard/floppy controller
- 250 watt U.L. listed power supply
- Hercules comp. monographics card with printer port
- 14" flat screen amber or paper white monitor
- AT deluxe case (space for 5 half-ht. drives, RESET/TURBO buttons, RESET/HDD/TURBO LEDS)
- Enhanced 101 mechanical-tactile keyboard
- Serial port, game port, parallel port

OPTIONS

20 MHz system upgrade	add $150
Color upgrade (640x200)	add 160
EGA upgrade (640x350)	add 395
NEC II Multisync Monitor w/VGA card	add 740
360 KB floppy disk drive	add 65
1.44 MB 3½" floppy drive (PS 2 comp.)	add 110
ST 251 40 MB hard disk (39 ms)	add 385
ST 251-1 40 MB hard disk (28 ms)	add 425
ST 4096 80 MB hard disk (28 ms)	add 645

286 SYSTEM: $1475

- 6/10 MHz (80286-10 CPU)
- 640K RAM on board
- 1.2 MB floppy drive
- 200 watt power supply
- Monochrome/graphics card
- 2 parallel ports
- 1 serial port (second optional)
- 1 game port
- Socket for math coprocessor chip
- On board clock/calendar
- AT case w/LED buttons
- AT enhanced keyboard
- **FREE AMBER TTL monitor w/swivel and tilt**
- **40 MB Miniscribe 3650 hard disk w/controller**

FREE CITIZEN 120-D printer w/printer cable

OPTIONS

Color upgrade (640x200)	add $160
EGA upgrade (640x350)	add 395
40 MB ST-251-1 (28ms)	add 130
40 MB ST-251 hard disk (39ms)	add 95
360K floppy disk drive	add 65
720K floppy disk drive	add 89
1.44 MB 3½" floppy disk drive	add 110
VGA upgrade	add 740

XT SYSTEM: $1125

- 4.77/10 MHz
- 512K RAM on board
- 1 360K floppy drive
- 150 watt power supply
- Monochrome/graphics card
- 2 parallel ports
- 1 serial port (second optional)
- 1 game port
- Socket for math co-processor chip
- Clock/Calendar
- XT slide-in case
- AT enhanced keyboard
- **FREE amber TTL monitor w/swivel & tilt**
- **30 MB hard disk w/RLL controller**
- **FREE CITIZEN 120-D printer w/printer cable**

OPTIONS

Color upgrade (640x200)	add $160
EGA upgrade (640x350)	add 395
360K floppy disk drive	add 65
720K 3½" floppy disk drive	add 89

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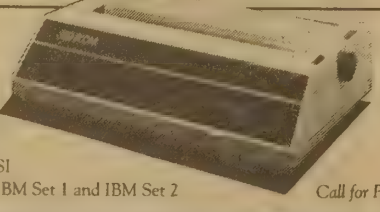

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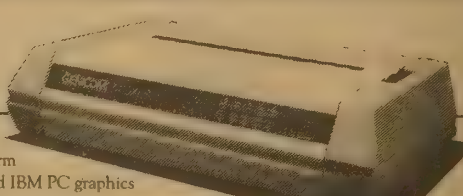

3410
- 400 cps draft/120 cps LQ
- 18 wire dot matrix/6-part form
- Protocols – ANSI x 3.64 and IBM PC graphics
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REALIZABLE FANTASIES • BY JIM WARREN

Power Surges, Glasnost, And War Stories

This offers expanded meaning to the concept of "system sharing" —proposals herewith placed in the public domain.

Self-Protecting Processors

Some innovative horseless carriage maker put an electric starter on their hand-crank sputter-buggies—and undoubtedly reaped handsome profits from that luxurious auto "option."

It's time for computer makers to finally offer a reasonably inexpensive short-term battery backup—as a compact, integrated option for their systems? As a designed-in option, it should cost a hundred dollars or less to support the system for one to five minutes—long enough for orderly shutdown by the user.

While they're at it, they should spend the extra $5-$10 to include robust spike and noise suppression for a computer's power supply. Modem makers should do the same for their phone line connections.

It would cost little; serve well; and—with breast-beating publicity—it would attract every computer user who has ever lost many hours of work due to a power glitch, or who has had expensive equipment or files fried due to spikes or brownouts.

LapTop Makers: Lie Down

Manufacturers of laptop computers should universally allow their flat-screen display to lie low. (Many do; all should.) Let the screen be placed in any position from completely vertical (rarely useful) to completely horizontal—to completely removed or replaced.

Some mistake-makers have illustrated amazingly poor human engineering by marketing laptops with screens that must remain almost vertical. Consumers should avoid these ill-engineered errors.

While we're whining: It's infuriating to find an otherwise robust laptop degraded by a tiny screen, secreted in a large top. Ditto for a half-screen in a half-top. At the least, serious users should be offered the additional-cost option of an adult-sized flat-screen that fills a full-sized laptoptop.

An Anti-Communist Plot

Tens of thousands of long-unused old computers are languishing in closets. "Old," of course, means 8-12 years. Given Glasnost, let's try sending the old, dust-laden, obsolete boat-anchors to citizens in Iron Curtin countries —and in U.S. supported dictatorships. When possible, they should include modems and encryption software.

A key element of this proposal is that the units must go directly to citizens—not to the governments.

Copyright © 1989 by Jim Warren. All rights reserved. *Jim Warren founded the* West Coast Computer Faire, *the* Silicon Gulch Gazette *and* Infoworld *newspapers,* Video Initiative *and the* DataCast *proposal for broadcast-based paperless electronic newspapers utilizing personal computers. He was the founding host of the* PBS Computer Chronicles *series, founding editor of* Dr. Dobb's Journal, *and founding president of the* Microcomputer Industry Trade Association.

Think of the possibilities: Computers are information processing tools—and information is prerequisite for any hope of freedom or justice. Further, consider what modems and encryption tools would do to evesdropping by internal security services.

Yes, that is a fantasy, but probably not realizable. Governments know that computers in the hands of their citizens are dangerous. Please note that the NSA and DoD are lobbying hard to get Congress to restrict citizen's access to computerized databases and restrict citizens' use of bulletin board systems.

Old War Story; Cold War Story

That reminds me: Some years ago, I was on a lecture tour in Japan and had lunch with Tony Tokai, then President of Commodore-Japan. At the time, Commodore PETs (I said it was some years ago) were as scarce as hens' teeth in the US—but I found out Tony could get all he wanted of these US-made micros in Japan. Simple; he was selling them for perhaps a kilobuck more than Commodore could peddle* them for in the U.S.

Furthermore, the U.S. had trade prohibitions against selling computers to China—gotta keep them evil commies contained (I *said* this was some years ago!). However, Japan had no such prohibitions—and Tony was making much loot for his Japanese company by selling PETs to China.

I think this is called, "How Political Paranoia Helps Other Nations Preempt the United States"—surely a topic for a future article. Prepublication comments herewith solicited.

*Digression-Squared

The peddle pun was too good to miss. 'Twas an affectionate ref to the indefatigable Chuck Peddle—giving much-due credit to the guy who talked Jack Tramiel (then Potentate of Commodore) into letting him design the PET as Commodore's first micro, which could have trampled Radio Shack if Tramiel had had better marketing vision.

But this is about Chuck. He really should have more recognition than the industry has given. Prior to the PET, Chuck was responsible for MOS Technology's 6502 microprocessor—which Woz then used to create his Apple.

And, after Commodore, Chuck headed the Victor Technologies roller-coaster. He took it to its height by guruing one of the first PC clones—that was better designed, more powerful, and less expensive than the IBM PC. Sadly, he also rode the under-funded Victor to its (near?) bankruptcy, trying to do too much with too little.

Unstoppable, he has popped back with Tandon, offering removable, shippable Winchester disk subsystems. Of course, I haven't talked to him for three or four months, so he's probably innovating some new venture by now.

Quickies

Over the edge: Perhaps we should call Chuck Peddle "Occam Man." John Wakerly has noted that "occam," spelled backwards, is pronounced "macho" —which I choose to somewhat redefine as risk-taking by those people of all sexes who choose to live with the excitement, danger, and potential rewards of the cutting edge; those innovators who convert Present into Futures. (Yes, I too, had to look up "Occam's razor.")

Governments know that computers in the hands of their citizens are dangerous. Please note that the NSA and DoD are lobbying hard to get Congress to restrict citizen's access to computerized databases and restrict citizens' use of bulletin board systems.

Notes of a long-ago luncheon: George Morrow said he wanted a CD PROM. Perhaps Radio Shack's long-announced writable CD will fulfill this fantasy—when it someday becomes fact. George also says his next company will be named Clones R Us. That, from the ex-mathematician and stimulating symbol manipulator whose other companies have included Morrow's Microstuff and Thinkertoys.

End view: We're waiting to see one of those "Baby on Board" signs that says "This Space for Rent."

Should You Get A "VC"?

Among the multitude of abbreviations used in computing—e.g, RAM, ROM, MHz, CPU—many folks consider "VC" to be one of the most important . . . and most infuriating. Without VCs, most of our current and future technology would not exist. On the other hand, they are commonly cursed by techno-makers.

These are the much-sought and much-maligned venture capitalists—also known as "vulture capitalists" by some experienced loot-seeking logicians.

I've seen more than a few microfolks get burned and get enriched by VCs. Thus, my queue of talk-about topics has notes and warnings for business-naive inventors and technologists regarding how to deal with VCs.

But, before belching forth observations regarding these controversial technology "support tools," I herewith solicit others' experiences and suggestions—good and ill—from both VCers and VCees.

Suggestions To Share

Send suggestions to Jim Warren, Realizable Fantasies, 345 Swett Road, Woodside, CA 94062. Published proposals will be attributed to their authors unless anonymity is requested. ■

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Age:
Sex:
Job Title:
Annual Income: ☐ 10-20k, ☐ 21-30k, ☐ 31-50k, ☐ over 50k

Where do you live?

☐ Northern California
☐ Southern California
☐ Out of state (Please specify)

What operating system(s) do you use?

☐ CP/M
☐ MS/PC-DOS
☐ OS/2
☐ Macintosh
☐ UNIX/XENIX, etc.
☐ Other (Please specify)

What computer(s) do you use?

☐ IBM PC/XT/AT or compatible
☐ PS/2 or Compatible
☐ Macintosh
☐ Apple II
☐ Amiga
☐ Atari
☐ Laptop (Please specify)

☐ Other

What peripherals do you have?

☐ External disk drive
☐ Hard disk
☐ Tape Backup
☐ Modem
☐ Dot matrix printer
☐ LQ Printer
☐ Laser printer
☐ Large-scale display monitor
☐ MIDI
☐ Scanner
☐ Video digitizer
☐ CD-ROM

☐ Others

What software applications do you most frequently use?

☐ Word processing
☐ Desktop publishing
☐ Desktop presentations
☐ Non-relational database
☐ Relational database
☐ Spreadsheets/Accounting
☐ MIDI
☐ Graphics
☐ Games
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☐ Time/project management
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☐ Mac @ Work
☐ User Group/BBS listings
☐ Calendar of Events

What issues or technologies would you like to see MicroTimes focus on during 1989?

What types of articles would you like to see more of?

☐ Product reviews
☐ Opinion pieces
☐ Interviews
☐ Columns
☐ How-to articles
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☐ News/Analysis
☐ Lists/resources

☐ Other

What topics would you like to see covered more often?

☐ Business Computing
☐ Graphics
☐ DTP
☐ MIDI Telecommunications
☐ Industry Issues
☐ Laptops
☐ Academic Computing
☐ Workstations
☐ Operating systems
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☐ Games
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☐ Programming

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Other comments:

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Color Graphic Card w/Parallel Port	$ 36.00
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Star NX 1000	3.00	4.00	★
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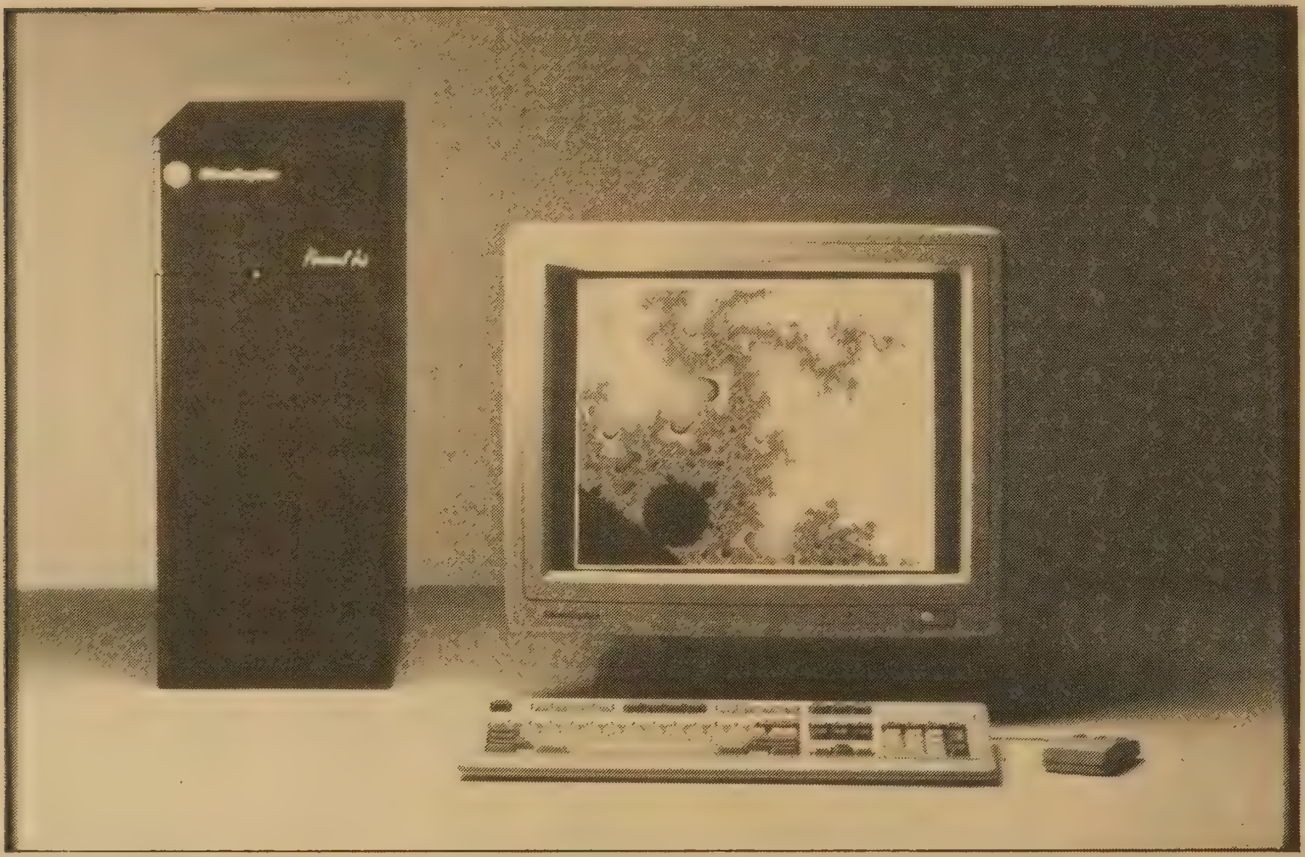
3D Graphics:
The Shape Of Things To Come

Silicon Graphics Prepares For The Volume Market Of The '90s

By Mary Eisenhart

PHOTO: SILICON GRAPHICS



The Personal Iris brings real-time three-dimensional graphics computing to a new level of affordability.

On the screen, an aircraft rotates in black space, its sleek surfaced bathed in multicolored lights from multiple sources. It allows itself to be viewed from all angles, letting the viewer zoom in for a closer look or out for the grand view.

You're in a tank,threading your way down the corridors and around the corners of a maze—at a rate of speed and instability that sets the motion-sickness-prone to begging for mercy.

There's a checkered room rotating around the screen. Inside the room is a little purple cube which purports to be made of Jello. As it bounces off the checkered walls, its shape changes to reflect impact and returns to normal as the cube becomes airborne.

"It's really a mind-expander, isn't it?"

—Silicon Graphics President/CEO Ed McCracken

Watch out, Macintosh. Watch out, IBM. Watch out, Sun.

Silicon Graphics, whose high-end, RISC-based, 3D graphics workstations have for some years been a mainstay of niche markets from video to mechanical design to aerospace, is taking aim at the under-$20,000 workstation market. The key element in its strategy: the Personal Iris, which starts just under $16,000. It runs the same software as SG's high-end, multiple-processor systems and, like its more sophisticated and expensive brethren, manipulates three-dimensional graphics in real time.

It's hard to exaggerate the sheer emotional impact of your first encounter with the Personal Iris. Especially if you've been in the habit of going to the mall while your Mac II struggles with fractals, or wishing that wire-frame model on your 386 bore some resemblance to *anything* in the real world.

The Personal Iris, which runs Irix, Silicon Graphics' licensed version of UNIX, includes some strategic features not usually seen on UNIX systems. There's a comfortable window-based interface. The system has been designed so that a naive user can have it out of the box, set up, and doing real work in 20 minutes. The RAM upgrades (standard configuration of the Personal Iris includes 8 Mb of RAM and 8-bit color) are user-installable. If something goes wrong with the machine, all its electronics are contained in an easily-removable box; remove it, FedEX it to Silicon Graphics, and a loaner box is on its way. Finally, in contrast to most UNIX machines, which arrive with an array of manuals rivaling the Library of Congress, the Personal Iris comes with a small book containing everything a user needs to know to operate and administer the system. (A full set of documentation is available for programmers.)

Currently a quarter-million-dollar company, Silicon Graphics is aggressively campaigning to open new markets by reducing the cost of its technology. At the high and the low end of the product lines, the company seems obsessed with delivering ever-higher performance at an ever-lower price, and becoming a key player in the evolution of the computer industry. And if, as is the plan, small businesses and individual designers come to demand technology you used to have to work for NASA to enjoy, we'll be hearing a lot more from this other, quieter workstation company from Mountain View.

We've been watching the progress of the Personal Iris for some months now (it was unveiled in October, and Silicon Graphics recently shipped its thousandth unit). Recently we visited the company's Mountain View headquarters to discuss its products and strategy with President/CEO Ed McCracken and Chairman Jim Clark.

We asked McCracken about the Iris line, what its current applications were, and what uses he envisions for the future.

What have been your markets until now? Who's been using your machines for what?

Ed McCracken: One of the nice things about three-dimensional graphics is the pervasiveness of use across a broad number of industries and applications. The biggest applications for our machines have been the automotive and aerospace market for different types of mechanical design and mechanical engineering. That's representative of 50 percent of our business. It's not the markets that we penetrated first, but it's the market that is the biggest, and we think it will continue to grow with us and be 50 percent of our business when we reach 500 million and when we reach a billion dollars. There's a lot of robusiness in that one marketplace.

The average mechanical engineer today either uses a terminal to an IBM mainframe, or they use a two-dimensional workstation. And they're dealing with three-dimensional structures, so it's awkward. Our systems can make a huge difference in the ease of use of the mechanical designer and how long it takes for them to get the job done. As a result, we think it makes a big difference in the competitiveness of corporations that commit to a three-dimensional approach.

That's the biggest. The first market for us was animation and creative graphics, and we feel that we have about 75 percent of the workstation portion of that market. It's about 10-12 percent of our business. Our current run rate is around $260-270 million total, so 10 percent of that would be maybe $30 million a year, which gives us most of the market. It's not a huge market; it will continue to grow some, but the nice thing about that market is that those people force you to have the best possible, most realistic image on the screen, and move it around in real time. That forces us to be on the cutting edge of new graphics architectures and new approaches to graphics. So then we take those capabilities and essentially do a technology transfer of those capabilities into the other markets, which are a lot slower to decide they need it, and that puts us way ahead in the other markets.

So that's another application. The third is gaming and simulation, where people use our product to simulate environments. The military was the first user here, where you use it to simulate a view out of a pilot's window, or those types of things, or to do mission planning, or to design a new cockpit of an airplane. But that's moved into simulations of manufacturing floors, and simulations of robots, and it'll eventually move into things like driver training and games, a lot of games that have a learning objective associated with them. That's about 25 percent of the business.

Then all the rest of our business, essentially, is in science. Visualization of chemistry-physics types of things. That's a very robust market for us, and it's an important market because it's leading edge.

We made a major transition in the company over the last year in that our products used to be ahead of everybody else in graphics, but the computing was, I guess you could say, marginal for most problems.

Because it was optimized for graphics?

It was optimized for graphics, and we just didn't pay a lot of attention to the computing, and then it became evident to us that the thing that was holding the graphics back in terms of performing was how fast we could feed the graphics data. So we started saying "Well, maybe we should increase the speed of our computing system." And so we kind of put our heads down and worked real hard to do that over the last two or three years—and then recently we kind of raised our head up and looked around and found out that the computer we had invented in the process was faster than anything else on the market in anything near the price range. It's that computing speed that's causing the physicists and the chemists and people like that to really beat a path to our door right now; they need the graphics, and the visualization is great, but the fact that it also is the fastest computer you can buy for anywhere near this price...

> **McCracken: "We're really out trying to convince people to write three-dimensional software, because it's a lot more fun to use, and it's fun to write, and it's going to be the volume market of the 1990s."**

This is at the high end or the low end?

This is at the high end.

So those are the primary applications. There are a lot of new applications that are kind of innovative—they don't add up to a significant percentage of our business yet; they might in the mid 1990s. Applications like using our product at the point of sale, where maybe eventually you're going to buy a car and you'll sit at one of our systems. You'll say, "I'm interested in this model," and it pops up on the screen; you drive around a bit on the screen, and then you say, "These are my color options," so it colors it the way you wanted it, and "These are the other options I want," the texture of the seat covers, and so on. You choose your car exactly and it prints out your invoice.

Or you go in to buy some kitchen cabinets, so the whole catalog of kitchen cabinets is available to bring up on the screen. And then you define your area that you need to put the cabinets into, and it pulls them up, and when you get it all right, it looks the way you wanted it, then you print your invoice for kitchen cabinets. That's another one.

There's another new one in color printing, in terms of using our systems, which are great color systems, to help people electronically with each color print. And then the architectural market is going to get interested in our machines shortly, and I think there'll be markets that expand out of that into interior design, and landscape architecture and all kinds of unique, lower-cost kinds of markets.

I read that someone was using it for fashion and textile design.

Levi Strauss in San Francisco. They're really saving a lot of money doing it, because they can take a picture of a model wearing a sport coat, and then they can say, "Well, I wonder what that would look like in a plaid." They can take a plaid material and put it over her, and they've figured it out so the plaid material will fit into the creases, in the armpits and so on, and look real. It's a pretty wonderful thing. And then if they decide they like it, they can go straight to the catalog before they start production, so they don't have to do a sample.

One of the things I keep hearing is that 3D is useful because it saves a whole lot of expense on prototyping.

Yes. Absolutely. I was just talking to some of our people about a major Japanese company which has a large number of our systems that they use for power plant design. They have about 100 of our systems, I think, and before this they had to make these complex models of a power plant that took up an area almost the size of a basketball court—plastic models that were that big. They've been able to eliminate that whole process and go directly from the models on the screen to the construction site. They can give sales presentations to the customers and so on, all on screen, and never build the models. And be able to do all the checking to make sure the pipes aren't crossed, and that you have all the room you need to do the pipefitting and so on, and that you don't wait till too late in the project to take in this pipe that has these curves in it because you can't get it through the other pipes to get it to the right place.

It's really neat stuff. And they're being much more competitive in their markets as a result, to the point that they're almost putting some of their competitors out of business.

Why don't their competitors get with the program?

It takes time. There is a learning curve involved.

It turns out that in using our product—using three-dimensional databases and three-dimensional software running on three-dimensional hardware because all three are important—the first phase is, you get on the learning curve. First you buy the systems and you experiment with them a little bit.

And then you move into phase two. In phase two, where most of our customers are, if the product design process is that you do some conceptual design, and then you do some simulation and some analysis and some plant floor programming, you use our systems in any one or all of those processes, and it makes each of those processes more efficient.

Phase three, which this Japanese company is into now, is when you say "Aha! I've got the database captured electronically, I can pass it back. I don't have to do serial design. I don't have to finish this design before these people get started. I don't have to pass it down the serial process; I can build a team made up of all of these departments, and I can put them all together and they can pass data back and forth electronically, and can turn the whole design process into a parallel process rather than a serial process. And maybe I can cut my design time by a factor of four. And as a result of that I can be more competitive in world markets."

That's where you finally get to in the learning curve, but if your competitor's doing it all manually and on two-dimensional workstations, and you're doing it in phase three, then they've got to go through phases one and two in order to get to three, and so you're way ahead of the game.

So there is a very important time issue in competing with companies using three-dimensional computers. The sooner you get involved the better off you are in our competitive world.

This may be a little out there at this point, but it seems to me that one of the natural applications of this technology is hypermedia. The Iris looks like the closest thing to a Xanadu machine I've seen yet.

It is. The hardware capability is going to be there, there's no question about that. It's going to take some software work. Each application has a slightly different hardware/software cycle. The advantages of three-dimensional activities in mechanical design were so important ten years ago that the major software vendors invented three-dimensional software and three-dimensional databases, which they've been running on two-dimensional machines for the last ten years. And now that they've got three-dimensional hardware, it's phenomenal.

In other markets, the three-dimensional hardware is there and the software is just starting to be developed now.

But the Personal Iris at its price point is going to allow a lot of very creative people to do creative software. Some of them are here at our company, but most of them are out there in the world. Hardware capabilities aren't going to be that difficult to put together.

What about virtual environments? They've got a helmet at NASA that puts you in a virtual room, where you can walk around and pick up objects. Do you see that type of application opening up as a result of these machines?

That's possible. The helmets at NASA are driven by our systems. They're hidden off to the side somewhere, because you can't put the system on your head, but the helmets use little pads that are in front of your eye and display the images on the pads. They were black-and-white the last time I was there; maybe they're color by now. Our systems drive those.

There are applications where I think our systems will be used with that kind of user interface rather than a screen. But who knows, in the 1990s, what will happen there? It's certainly one of the things we're watching; our systems are being used as experimental devices.

I have trouble myself believing that the average architect will come to work and put a helmet on their head and design their house. It's possible, who knows? There's no reason why it's not technically possible.

You do see that screen and want to jump in.

Right. You really create an artificial environment of these ideas, so the ideas you have about this city block you're designing become your reality while you're designing it. You can see how it would really unleash some nice creativity.

PHOTO: MICHAEL JAY

Clark: "The technology of integrated circuitry, and memory, and so forth, is now at the point where you can produce a 3D machine at a low price. And we're aggressively pursuing making them avaiable at lower prices yet."

I can see game developers flipping over this machine if you can get the system price down.

Yes, and especially with fiber optic technologies as they're developing, you could have group games that could be really exciting, where you'd not only exist in the space, but multiple people exist in the space. Which would be kind of fun.

The Personal Iris is really our fourth-generation product. We've been working on three-dimensional graphics in computing for about that long, and it's so different from our first- and second-generation machines. Our first- and second-generation machines were primarily used in wire-frame mode. Everything was vectors, and we quoted vector rates and line-drawing rates and those types of things. And we've gone so far beyond that now, because we think realism is important.

There are a lot of other companies in the industry that I think will be introducing some "three-dimensional" products this year, and they will primarily quote vector rates. I think the market's going to be a little confused sometimes about what they can do versus what the Personal Iris can do. We're trying to simulate reality on these systems. We're trying to make the image real—you can't do that with stick figures, except in electrical engineering, where if you're dealing with schematics or something, you might be able to get by. But for the applications we're interested in, you need lighted, shaded surfaces that can operate in motion in real time.

Silicon Graphics executives are fond of saying "If it don't move, it ain't 3D." Could you elaborate on that?

Earlier I talked about a lot of the mechanical CAD companies having developed 3D software during the last ten years because they saw the need for a three-dimensional database and for the three-dimensional software to operate on the database. So they would sometimes call their applications 3D. And they *are* 3D, except when you went to use them on any workstations that existed, they could only draw one image every second or every two seconds. Or even every ten seconds. And as a result you couldn't move it on the screen.

If you can't move the image on your screen, you can't get a feeling for the third dimension. You may be able to take a three-dimensional database and bring it out on the screen, but once it's there it's just a two-dimensional flat picture. And in order to really understand the depth of the image you've got to repaint it at 20-30 times a second. When you see a movie, you see 24 frames a second, and 24 frames a second is about the right speed to view an image at.

That's why the graphics for three-dimensional computing is so much more complex than two-dimensional workstations—you have to repaint the screen 20-30 times a second. So there's a lot of controversy about what really is 3D, and we just make it easy: if it doesn't move on the screen, it isn't 3D.

What's the difference in the speed of image movement on the Personal Iris compared to the speed of your high-end systems?

It isn't so much the difference of speed, it's how complex the object can be and still move at 20-30 frames a second. I think there's probably around the order of five to ten times difference in the complexity of the object that you can show on the screen, moving in real time. So if you can show a house on the Personal Iris and move it, on the higher system you can probably show the house, and you can probably have windows on the house, and you might be able to see through the windows and have the windows be translucent. Maybe you could have a tree, and maybe you could have a few other things, and still be able to move around it. On the Personal Iris, maybe it's just a house. That's it. The windows aren't translucent.

Light sources are pretty much the same?

The same algorithms are used, it's just that we use so many more processors on our high-end systems that we can do things much faster. But one of the nice things about our product line is we use the same algorithms top to bottom, which means that the same graphics software can run on all of our systems.

Which is a great thing for the software companies, because they don't have to have different versions of our systems, like they do on most of our competitors' machines. They can use the same software across the entire line, and it's all binary compatible from both a computing and graphics standpoint.

It truly does change everybody's experience of ever using a computer in the history of computing. History of computing: 2000 BC till today.

In your mind, you create images and thoughts and feelings, most of which have depth, and historically you've had to squeeze it and change it and linear-ize it—generally move it from your right brain to your left brain, get it out into symbols the computer understands, and then the

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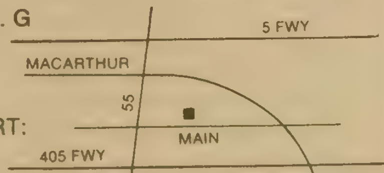

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computer chunks away on it and gives it back, in symbols the computer understands, and then you take it from your left brain and try to feed it back to your right brain. And of course by now your right brain's asleep.

As you know, creativity has momentum, and when you can keep your right brain of your mind enraptured by something and going on it…

Once you find that groove you want to stay with it.

You get the groove, you get the high, and you kind of go for it, and you make these trememdous leaps. It's our belief that you'll be able to do that with this class of system.

Of the customers who are considering a PC or Mac II workstation, or maybe a low-end Sun/4, who should look at the Personal Iris too?

We're repositioning our company. Nine months ago we wouldn't have been on the map. We wouldn't have been considered at all. Today we are being considered in a lot of applications, and I think we will be considered even more in the future. A lot of it just depends on whether you've heard of Silicon Graphics or not, and that doesn't vary all that much by application—it's just that we're so new in this marketplace.

Our prices are not all that different. The price of our system and the price of a Sun/4 is about the same. And if you load up a Mac, as a lot of people do at the high-end applications, then it gets to be about the same.

So the person that will tend to use who's got one of three requirements. One is that they know they have significant computing needs, that their application burns computer cycles. If so, there's nothing faster anywhere near the price range than our system. There's nothing faster at two or three times the price than our system, just in terms of cranking away at the computing behind the applicaton.

There isn't a better full-color system on the market, so if you really want 24 bits of color and you want that handled really nicely, our system is great at that.

And the third reason is if, in what you're doing, you want to deal with anything that has a third dimension, anything that has depth. Our system handles the shallow stuff fine, and a lot of the full-color thing is just two-dimensional stuff, and if you need full color our system is great. But if you want to do anything with depth our system is the obvious choice.

And of course it has a lot more screen resolution than a Mac, also. Even the Macs with all the add-on boards get up to maybe 1024 by 7-something, and ours are 1280 by 1024.

In order to do all this graphics handling and fast computing, you need a lot of RAM.

Yes, we do. Video RAM, mostly.

That's been something of a problem lately—has this affected you significantly?

Well, yes, it has. When we set out to design the Personal Iris two years ago, we expected it to come in closer to $10,000 than $15,000. We thought by now we'd have been able to price it down in the $10-$11,000 price range. We had to introduce it at $15,000. The big difference is RAM price.

We use two different types of RAM in the system, dynamic RAM, which is like everybody else's, for the main computer; and then we use video RAM, which stores the information right before it goes onto the screen. So it has the information about color, and what's in front and what's behind, and those types of things. Those have been in short supply. We've been able to get enough to meet our needs, but the prices are certainly a lot higher than we expected them to be two years ago.

The Personal Iris seems a lot more accessible to relatively naive users than most workstations.

We've gotten tremendous feedback. We shipped 1,000 systems last quarter in a 90-day period of time, and we've gotten tremendous feedback from our customers that they were able to take the systems out of the box, put them together, get them running, in less time than they could a PC or a Mac, and a *lot* less time than a Sun product. The system is much more approachable, and that was our objective. We spent an awful lot of time with that. We had a lot of videotaped focus group work, where we brought people in and had them do all those things and be videotaped, and we made signficant changes to the product, in the packaging, and software, and the boxes they came in, and the manuals, because of that videotape work we did. It was really effective.

You have user-installable RAM upgrades.

That's right, we do. And we're getting very positive feedback on that.

Nobody's frying their motherboards?

Nobody's frying their motherboards. It's even better than we thought. It's a little surprising to us, because we were doing it as kind of an experiment. This is working quite well—we did some focus group work on that too, and as a result we changed the sockets a little bit.

Where do you plan to go from here with the Personal end of the product line?

Well, we're not pleased with our current prices. We think the performance is nice, but we're not pleased with the performance either. So the $15,000 barrier that we're currently at is going to break, and we'll get the prices down to 12 or 10 or nine or eight [thousand]; we'll take it down as far as we can. We don't think there's anything inherently more expensive about a RISC machine than an Intel- or a Motorola-based machine.

We think that in the 1990s there's no reason that you should pay any more for our low-end machines than anybody's PC—powerful PCs, of course—and the performance should be really dramatic.

The other thing is, even our systems don't have the kind of realism that customers really want. If an architect is designing a house, they want the house to look real. It looks *pretty* real on our system, but there's no trees in the yard in front of it, and the walkway and the street and the texture on the side and so forth—if you put all those things in, and you make the house really complicated, you can't really rotate it in real time, like you'd really like. There's an awful lot of things from a graphics standpoint that we plan to make better, both in terms of more performance and more features.

And then the third thing is just software. We plan to put a lot more emphasis on software. We have an internal objective to go from 400 packages, which we have today, to 4,000 packages in three years. So that's taking a lot of our energy and a lot of our time.

Maybe the last thing is we're readying distribution channels. We're in the process right now of signing up dealer/resellers—I think what you'd call VARs. They are geographical in nature, they're not nationwide, and some of them have storefronts, some of them don't. We're following our software partners into them. So we're working with CADKEY and Sigma Designs—CADKEY is in mechanical design, Sigma is architecture—and we're going out to their resellers. Our objective is to have 50 of them signed up by June, which is a good start, we think. It's a test program between now and June, and then we'll expand it after that.

So that's a new thing for us as well, and of course that would become more and more important to us as our prices come down.

Are there any particular types of software applications you're interested in attracting?

Well, yes, obviously, there are. Anything in mechanical design, anything in architecture, are very important to us, but beyond that we specialize in chemistry, we specialize in anything in the publishing area, anything, certainly, in the gaming and simulation environment would be good.

But more generally, we believe that the really significant software that will run on our system, and other people's three-dimensional systems in 1995, hasn't yet been written. So we're really out trying to convince people to write three-dimensional software, because it's a lot more fun to use, and it's fun to write, and it's going to be the volume market of the 1990s.

What are the demands that 3D imposes?

I think the opportunity that it creates is that you can assume you can move whatever you have on the screen. It changes the nature of the way you write the software, because you assume motion. So you're creating a movie at the time and so you write it a little bit differently.

Beyond that, it's not that different from writing any other kind of software. You have to pay attention to the object itself, the environment in which the object exists, how the object is lighted, what kind of textures it has. Those types of things. Which a lot of programmers aren't used to yet—on our system we have something we call our three-dimensional tutorial, where you can try out how to program to change the texture of an object, and how to program to change the lighting of it, and whether it's a pinpoint light source or a more diffuse light source. We build a lot of those types of things into our systems.

For somebody who's essentially a computer illiterate, how long would it take them to be doing useful work on these machines?

It depends. If you're a computer illiterate, it means you're not going to use the system unless an applications package exists that you need to use. So it depends on the applications package.

If you're a chemist and you're a computer illiterate, and you're at Genentech and you're going to be designing molecules of certain types, then you'll buy software from one of about four sources, all of which run on our machines, and maybe in about a month you'll get pretty comfortable with it.

Or if you're an architect and you bought the Sigma Designs software, you'll probably be comfortable in a few hours. It varies by market. If you're a film animator, it may take a little longer, because the software's

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pretty complicated, and that kind of software tends to assume that you're a genius, because the film animators tend to be kind of creative geniuses. It varies—each software package has a little different learning curve.

We're shipping something we call Quick Model and Quick Paint with our system, which gives the computer illiterate a chance to bring the system up and build a three-dimensional model and animate it without any knowledge of a computer at all. He should be able to do that in the first hour—which gives you a chance to feel successful, which is really nice. You don't have to do any programming to do that, you just have to choose options on a set of menus and icons.

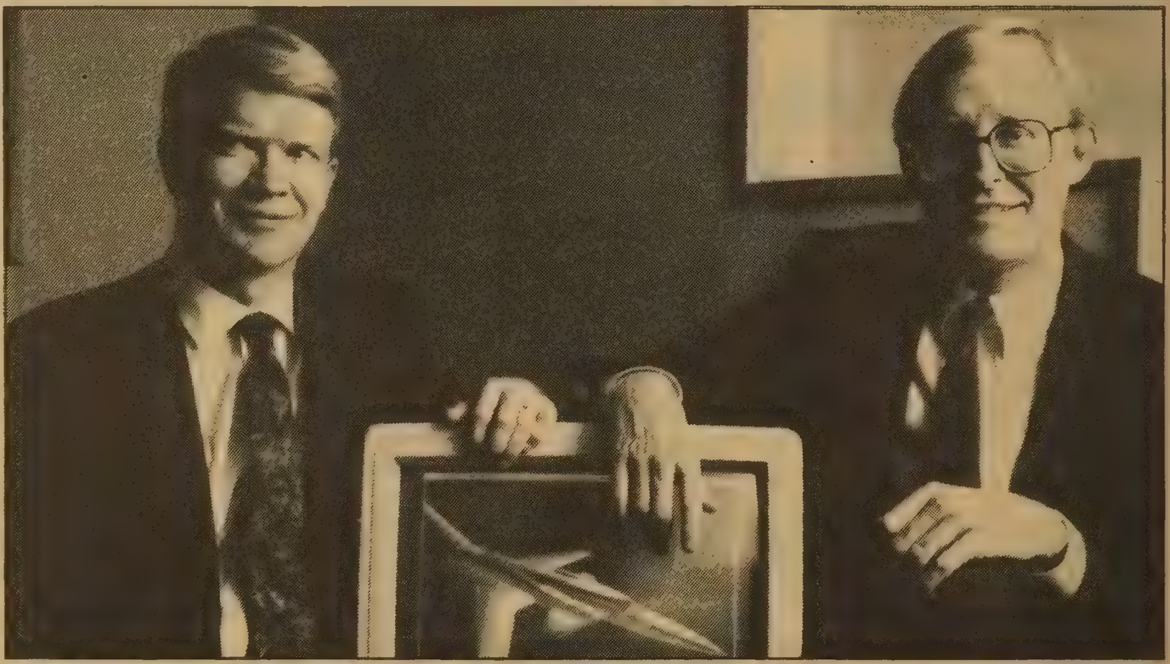
And then we have WorkSpace, the icon-based user interface on the Personal Iris. It makes UNIX a lot easier to work with. Initially it's on the Personal Iris, and eventually the whole product line.

We have a lot of very nice icon-based UNIX administrative tools on it. When OSF or the standards organizations agree on exactly what the user interface that goes on top of UNIX will be, then we'll overlay that on top of what we have. But this will exist until that time, or maybe even beyond that time, as our primary user interface. ■

The Big Picture

Silicon Graphics Chairman Jim Clark On The Workstation Marketplace, Standards, And 3D

PHOTO: MICHAEL JAY



Clark: "You can buy a $15,000 motorcycle or a $15,000 pickup truck—they're not the same product, they're not the same market. We have a $15,000 3D machne, and it's going to have some overlapping capabilities with a 2D machine. But they're really very different products."

What needs was Silicon Graphics' intended to address?

Fundamentally we were driven by the lack of real usable graphics systems of the type that I had always been exposed to—real-time three-dimensional systems, basically, doing things and being able to connect with real-world physical problems in a very interactive way. So graphics has always been the drive of this company, in particular 3D graphics, but I would say that over time that'll probably broaden quite a lot.

I like to think of the company as sort of the graphics computer company—*not* the computer graphics company. We sometimes focus a lot on 3D because it turns out a very significant part of the world is three-dimensional, and it's the part that really hasn't gotten developed.

Designing three-dimensional things has always been a pencil-and-paper type of discipline. The currency of trade of a lot of three-dimensional engineering has been the drawing. But over time, with more and more computers at your disposal, the drawing on the piece of paper will become less important and the media of exchange will be the computer. When you're dealing with a three-dimensional object, you want to be able to exchange the three-dimensional object, which you obviously can't do, but you want to be able to convey to a manufacturer on a floor, for example, "Here's what the part has to look like." And to the engineer who's doing the engineering, you have to be able to convey "Here's what the stresses mapped onto this object look like if this object is put under certain kinds of loads." So it's a kind of soup-to-nuts desire, is what the objective of the company is now, and it focuses largely in the CAD/CAM/CAE area, but it's going to evolve into a lot of other areas, such as chemistry and architecture and all of these disciplines that are three-dimensional.

The roots of the company really are driven a lot by graphics, but you can't have graphics in isolation. The whole workstation industry came out of the merging of computer graphics and computing into one box. To some degree the same is also true of the personal computer industry. It is the principal interface to a computer, your visual system, so having a very high quality graphics system is really important. We've been the leader in that area in the three-dimensional area, and we intend to remain that way.

Who are your competitors in 3D?

Competitors tend to come in categories related to a particular application, or a particular installed base that they've already developed because they were here before with computer systems, or they had a two-dimensional product that they've gotten into accounts with and they've grown rapidly. So you can look at it on the one hand and say there *are* no competitors, but then realistically every computer company is a competitor, and every workstation company is a competitor.

On a one-on-one basis, if the requirements are three-dimensional we tend to have no competition. I suppose in that dimension the company that has surfaced most has been Hewlett-Packard. Hewlett-Packard doesn't seem to have a competitive product line relative to us. They just basically don't. At a given price point, we've got a much better product in the 3D area.

Who needs 3D?

Who doesn't?

The world's going to be a very different place in another 10, 15 years—the way computing is done, the way engineering is done. And all engineering that entails designing or understanding some kind of three-dimensional phenomenon will evolve to

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Jim Clark: "The world's going to be a very different place in another 10, 15 years—the way computing is done, the way engineering is done. All engineering that entails designing or understanding some kind of three-dimensional phenomenon will evolve to the point where it has to have and will use a computer."

the point where it has to have and will use a computer, to both visualize and do the actual design in a more upfront three-dimensional manner. Today, the starting point for design, for the most part, is a drawing. Even when you go to a 2D workstation, it's still the starting point.

There are lots of disciplines and lots of areas of applications that aren't three-dimensional—desktop publishing is not three-dimensional. Spreadsheets. I have a personal aversion to trying to find a way to present data that's not intrinsically three-dimensional in a three-dimensional form—for example, a three-dimensional view of financial data, or three-dimensional bar charts.

I don't think that serves a purpose, and it certainly isn't what drives us when we think about this. It's more—what is the discipline innately dealing with? In architecture it's obvious, right—it's a building. In designing industrial products—chairs, coffee pots, packaging for any kind of product—it's a three-dimensional thing. Automobile design, styling, down to the levels of mechanical engineering—that's all three-dimensional. Aerospace industries—it's all three-dimensional. Chemistry—we've been making stick figures in chemistry. Remember when you took your college chemistry class and there was always this little stick figure? It's a geometric process.

Medicine—a lot of medicine, a lot of reconstructive surgery modeling being used, and understanding three-dimensional images, CAT scans and NMR images. Those are really three-dimensional images, as opposed to geometry. You infer the geometry from the image—X-ray is a two-dimensional image from which one infers things about the bones and internal structures of the body, and likewise NMR or CAT scan type of technology is a two-dimensional imaging technology. Nonetheless, people derive from those images 3D shapes which are then represented as geometry. For example, some of the reconstructive surgery and hip joint manufacturing—finding the precise angle for the hip joint in order for it to fit a particular person, sort of customized hip joints as opposed to standard-part hip joints. I know there's some people back at Cornell using it for that.

You design the part onscreen and then it's manufactured to the computer's specs?

Yes. The point is there's an X-ray, or maybe even an NMR scan, of this person's hip, and the idea is to get the precise dimensions of the ball, and the precise angle that the ball needs to go away from the socket, or that the piece that connects to the leg has to go away from the socket in order to be a proper fit for that particular individual. All of us are slightly different in our geometry, so it's really important for that.

So my answer to the question is that there are certainly some disciplines that aren't 3D, but by and large engineering, as I see it, and science are three-dimensional.

How does a software package like AutoCAD in the micro world fit into what you're talking about?

It's a drafting package. There's a little company called ParaComp that has a couple of products I would consider real 3D products. One is *Swivel 3D* and another is *Model Shop*. *Swivel 3D* is a little animation/conceptual design modeling package for creating simple geometric models for animation purposes. *Model Shop* is an AEC (Architechture/Engineering/Construction) package that's a conceptual design package. It allows a conceptual three-dimensional model to be constructed right there on the scene of your new architecture. The thing that you have when you're finished is this three-dimensional model that you can get renderings of, see from different points of view, take walk-throughs of—it's for the up-front conceptualizing phase.

After that phase you need to go into the drawing phase. So it's really something that would work as an adjunct to *AutoCAD*. You do need drawings in the architecture business. That'll change. Specific drawings as we use them today will change significantly over the next years, but for today it's still the currency, as I said before. Exchange between a contractor and an architect or whomever.

So *AutoCAD* is focused on today's need to have drawings. It's been pretty successful there. But they aren't a 3D product. They've tried to add some 3D capabilities, but after the fact is a little more difficult.

What are the capabilities of your various machines?

Personal Iris is the highest performing workstation available with 3D graphics in the under-$20,000 price range. It's 10 times the old VAX 11/780 in basic compute power, and it's got computer graphics power that's about 30 times faster than what we first introduced four years ago. So it's a pretty powerful little machine, the one that a lot of people are most excited about.

Well, not that many people are in a position to go out and drop $80,000 on a high-end system.

Exactly. Well, that was the reason for doing it. We would have had a low-end machine a long time ago, but we chose not to, because we wanted to make sure that we continued to make 3D machines. The technology of integrated circuitry, and memory, and so forth, is now at the point where you can produce a 3D machine at a low enough price. And we're aggressively pursuing making them available at lower prices yet.

That's a real important thing for us, to continue to make 3D machines, and compatible. Right now Silicon Graphics is the only company that offers a totally compatible product line. Every other computer company, every other workstation company, has two or three different CPUs in their product family, including Sun—at least three, the 386, the 68000, and SPARC. Whereas ours is Mips CPU top to bottom, and we're the only company that has object code compatibility.

So there's a lot of similarities, but object code compatibility means you can take binary file written on one machine and run it on another machine. So a file or a source program that's developed for the Personal Iris can be compiled and put in a runnable format, and you can take that format and immediately run it on the high-end machine without changing it.

So you can preserve your software investment.

Exactly. Software developers develop code for one machine and they can run it on all of them. It's a story that DEC used to have, in the compute side only, not the graphics. DEC used to have this story for computing on the VAX/VMS line. And right now we're the only company that has that. It's turning into a pretty powerful marketing tool for us, to convince people to develop more software, and to encourage people to buy from us in a given competitive situation with another company, which might have a product that's moderately competitive at that particular point, but they don't have the rest of the product family.

A good example there I think is probably some of the high end competitors, and there's a bevy of them, that are fairly noisy and strident but haven't been very successful selling against us, not only because we seem to have a faster product at the high end than they do—I think that's probably a surprise to them—but also because we have the product family and they don't. So it's a powerful set of processors; it spans the range from $20,000 up to about $150,000.

You develop your own system software, but not application software, is that correct?

Right, that's correct.

So how do you work with application developers?

Very carefully. (laughs) We're partners. Our livelihood depends on their getting software on our platform. So we work with them through a program called the Geometry Partners Program, which has a variety of different points, one of which is putting aside money to help them do co-advertising with

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Customer Profile

Danny Goodman

Age: 30 something.
It's hard to tell on guys with beards.

Profession: Author of the all-time best selling book, *The Complete HyperCard Handbook*, and more recently *Danny Goodman's HyperCard Developer's Guide*; software developer (*Business Class and Focal Point II*). Described as a genuine "Renaissance Man"!

Hobbies: His idea of a good time is to scan the comprehensive quotes of the great Serbo-Croatian poets while enjoying a good glass of Chenin Blanc. Napa Valley, of course. He prefers non-computer keyboards, like the one on his Bechstein grand piano. A compulsive researcher!

His Page Recognition Software:
OmniPage, of course. According to Danny: "In preparing a book, or working on a special project, I need to get at information quickly to avoid disturbing my work flow. With *OmniPage*, I can scan virtually any font, or font size, in any column format, and easily place it into an existing file. I'm building a library of articles, relevant to my work, on a variety of subjects."

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us, as credits, in a sense. Providing them machines at discounted prices so they can get software up. A variety of things like that.

All your machines are RISC machines at this point?

Yes. We're also probably the only company with that distinction. One hundred per cent of our sales are on RISC machines.

Probably the most well-known RISC architecture is SPARC from Sun. What led you to go with the Mips processor rather than SPARC?

The Mips design is better. That's the reason we went with it.

Better in terms of what?

Faster. For a given clock rate, you get more work done. So if you fabricate both chips on the same technology, and they can both run with the same clock rate, one does more work. The Mips chip does more work, that's a fundamental difference. Running UNIX, running standard applications, it delivers more work per unit time than does the SPARC chip using the exact same clock rate, by somewhere in the range of 20-30 percent. Significant enough that, for example, at the same clock rate we get 10 MIPS and the SPARC architecture tends to get around seven or eight MIPS. So it's not insignificant.

Aside from that—that's just sort of the bottom line—the other thing is that Sun has throughout its history been fairly—Sun is sort of after all markets. It sort of thinks that it can take over all of technical computing. And at the time it was being offered and we were making the decision, we could get the Mips chip and we couldn't get the SPARC chip. Mips was available beforehand. Even if they had been available at the same time, there was the clock rate performance difference, but even if it hadn't been for those two things, we probably would've looked for an alternative just because it was coming from Sun.

On three or four different occasions in the last four years they've said "This is the board that we're going to stick into Suns and sort of negate the need for Silicon Graphics to exist." They've been pretty aggressive about trying to come into the 3D market, but they just haven't been able to do it.

Connectivity and multivendor environments are a big issue these days. How important is connectivity in the environments you're operating in?

It's essential. But every company that's trying to be a major player in big corporate America and corporations throughout the world has to supply all that. It's a given. What you've got to do is add the real-time 3D and the software to make a difference so that you can fit in those environments. You *have* to be able to. We're a licensee of a lot of these different technologies—for networking NFS, for example. We use a lot of that kind of technology.

Connectivity is crucial. At McDonnell-Douglas, connectivity to IBM is important. At Boeing, connectivity to the Cray environment is important. At NASA, connectivity to the Cray is important. Connectivity to the DEC world has always been an important thing, because they were such a dominant technology computer company. But you've just got to do a little bit more.

We spend our energy working to make our graphics better, let's say, and graphics architectures faster, whereas Sun might spend more energy developing a CPU, the SPARC architecture, because they felt that was necessary for some reason. We try to license compilers and get the kind of stuff that a lot of other people invested a lot of energy to make, rather than developing them ourselves.

Concentrate on what you do best already.

Exactly. Where our unique value is, concentrate there to continue to be uniquely adding value in a way no one else can.

Do you foresee that 3D is going to be something that people come to demand in general computing as well as technical?

Oh yeah. No question about it. It'll be on all machines—but who will have the best? That's the question. And it's our intent to be the company that comes rolling off your tongue when you ask that question.

Think about the computer industry in the last 20 years. The companies that sort of rose out of the ashes there on the basis of compute technology—DEC, Data General, Prime, CDC, IBM, Unisys, Burroughs, and companies throughout time. They dominated on the basis of some unique architectural or technical edge—like DEC, for example, just built a better machine than some of their competitors. Data General just kind of lost it, lost whatever their formula was for doing good machines. And then others benefited or grew, not so much on the basis of technology, but just by going after market niches, big commercial market niches that IBM wasn't successfully addressing, or was ignoring.

We're in a technical business. We want to remain competitive on the computing side of things, but absolute leaders on the graphics side of things. For the

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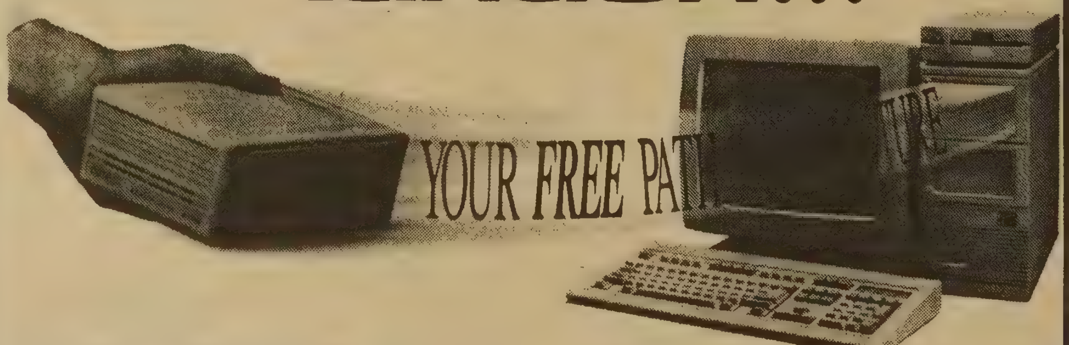

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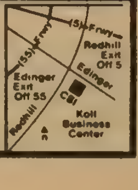

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That's right. Our compute capability is extremely good today, and we hope to keep it that way, but we'll keep our leadership in the market by having the best graphics. I think there's still big opportunities to grow and always be the best. We're known right now for that.

Your operating system Irix is UNIX System V.3?

System V with a whole variety of extensions, including virtually all of the Berkeley extensions.

Are you going to go to V.4 when it comes out?

We'll go to the best one. V.4 is the most likely, I would say. AT&T, as far as I'm concerned, is still the source for UNIX. I tend to agree with what Scott [McNealy] said in his interview ["The World Ac-

Who needs it?

Well, you know, I can understand. The bottom line, the reason that whole thing got polarized like it did, is because it appeared to the rest of the world that Sun was trying to pull a fast one with AT&T.

If, in fact, UNIX development fell under Sun's control, which is the way it seemed at the time that the announcement of the alliance with AT&T and Mr. Cassoni's joining Sun's board of directors and so forth—it seemed that Sun was essentially going to get the control of UNIX, and that *should* worry the rest of the world. Contrary to whatever they say—they've got great marketing statements, Sun, but in fact they're out to take over the entire computing world. And if they see UNIX as a vehicle for doing that, they're going to do it. So there's nothing benevolent about their behavior.

So that caused this other reaction. They're the ones that caused OSF to come into being, is what I'm getting at. And if in fact Sun and AT&T did stay in this tight alliance, I think you would find real merit in what OSF is doing. They would *have* to find merit, because it couldn't be at the disposal of Sun.

As long as AT&T is kind of this harmless vendor of UNIX, harmless to all computer companies, so long as they can retain that somewhat unbiased posture, it will continue to be a standard based on their UNIX. And there will be no reason for OSF to exist. That's what's ironic about all that—Sun complains about it, they poke holes at it and shoot at it and so forth, but it will absolutely be successful if they end up going off and causing a polarization.

So they're really in control of it—all they have to do is relax it. Well, AT&T is more in control than Sun is. I think their whole thing was considered—from my perspective, at least, it was considered a mistake once Cassoni left and went back to Olivetti. It's my perception that everyone was kind of looking for a way to gracefully get out of the deal with Sun in some fashion.

If I were in AT&T's shoes, I sure wouldn't want to put all my eggs in Sun's basket. Sun is a very successful and good company, but there are lots of other companies who are going to use UNIX. Unless they have another agenda. They may have another agenda, like acquiring Sun, or having Sun be their principal marketing arm for computing.

How much of Sun's talk about building open, cloneable machines do you honestly believe is real, and how much do you think is a marketing position? If there truly were a machine out there offered by the Japanese that had access to every single piece of what's available from Sun—all of the window management tools, the networking tools, the program development tools—and were truly cloneable, they would shake in their boots. It's total garbage, what they put out in that sense, I think. I think it's good marketing, but it's not true when it comes to McNealy's statements about cloneability. It isn't.

You cannot take an application developed for a Sun and easily port it to anything else. I don't care if it uses the same UNIX and NeWS and the whole bit, because there are other ways it gets subtly wound around Sun hardware. So they have a captive audience. They absolutely have people right by the nape of the neck. It's not as bad as someone being wired into VMS on a DEC machine where they've written some assembly code, but it's still an insidious kind of commitment that almost catches people unawares. So it's not true, it's not real, this notion of cloneability and they're totally open and all of this—they're smart enough to realize that people are wired into them, and they put out this image, and it's been extremely successful. But it isn't true.

Well, from the user standpoint the cloneability of the PC was a great thing, but it sure horrified IBM

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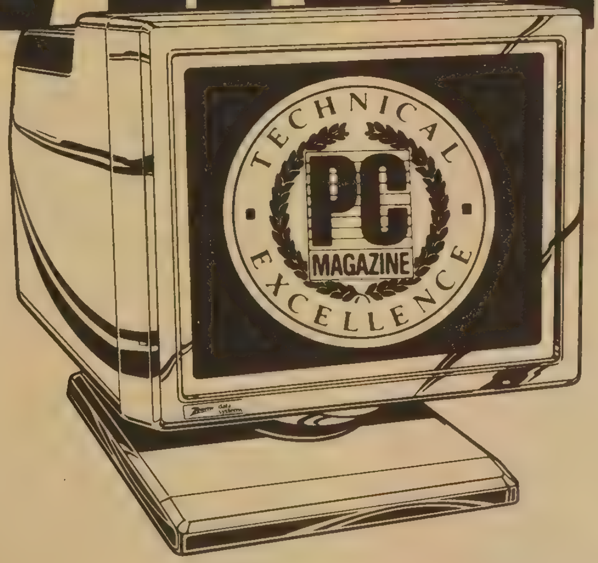

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once they realized what they'd done.

And in fact they have given up on that now, haven't they? And they're getting criticized for going to something that's somewhat more closed, but basically if Sun really believes in cloneability, then make their stuff available at low cost. License it to Sony, for example, or NEC—that would scare them, and for good reason. So I think that Sun's got a great marketing campaign going, but in reality anybody who's ever written a piece of code for a machine realizes that—you go to any software developer, and if they have to change one line of code in order to make it run on a different machine, it's a massive decision. Because for one thing, there may be a million lines of code and they don't know where that one line of code *is*, you know? And they've got to go in and find it and change it, maybe. It's a big decision.

> **Clark: "They've got great marketing statements, Sun, but in fact they're out to take over the entire computing world. And if they see UNIX as a vehicle for doing that, they're going to do it."**

But isn't the open architecture to some extent an outgrowth of the portability of UNIX?

No. UNIX was set out with the true objective of being a portable operating system. But not for any marketing reasons, just for technical reasons, because the people at Bell Labs who developed it wanted to be able to run it on different machines. It was intended to be portable. Mainly it ran on DEC machines.

See, the fallacy is that Sun's marketing of the openness is believed by people, and Sun maybe even believes it themselves. But marketing is a large part of the game, and they've been a very successful marketer.

Our company is—there's some differences. They appealed a lot to computer science types. We appeal a lot to non-computer science types—the artists. We appeal a lot to the artists. A lot to the physicists, the chemists, the medical doctors. They see our stuff and say "*That's* something I can relate to! Gee, is there some way I can do this?" And the animation people, and mechanical engineers. The analyst—the person who's trying to understand why a part might fail under a certain scenario—he's trying to see the part. Finite element analysis. Fluid dynamics. Studying an airplane flowing through the air. These are all three-dimensional pheonomena that people are trying to understand and deal with. Those are the kinds of people we appeal to, much more so than to the computer science, the program developer for its own sake.

Would that be at all analogous to what the Mac did in the personal computer world?

Yes. I think we're very similar. I think there's a very analogous line to draw between ourselves and Apple. We're very similar in that we offer these visual programming environments. It's a graphic computer. And we will expand into other more conventional 2D and image processing areas, because we want to be a completely integrated graphic computing environment above the low-end distribution channels. Above the sort of $10,000 price range.

The DOS computing world doesn't know how to take Sun at all. It's pretty funny to see an audience of Suits thrown into complete confusion by a typical Sun "here it is, here's why we're doing it, take it or leave it, bye" presentation.

Well, on a technical basis the Sun machine is better than a PC by any measure. Their low end machine is a better machine than a PC or a Mac, on a technical basis. But on a technical basis, a Silicon Graphics is better than a Sun machine. It is. It's got better graphics, a faster CPU.

But there's a very different set of marketing things, and Sun of all people ought to know the value of being there first at the low end. See, Apple and IBM and Compaq own those low-end distribution channels, and Sun is having a real hard time breaking into them. Even if they do, I think the low end is a very, very simple community compared to the community that Sun has been selling to, simple in the way they think about computing. UNIX is overwhelming to them. I'm talking about the people that work at Businessland and sell computers—go in and talk to those people and see if you think they're ever going to be able to understand UNIX. No way.

I've talked to salespeople who have trouble understanding MacWrite.

(Laughs) That's right.

I mean, they're ready to take your check and pull out the order and check off the features that you want, and some of them have some reasonable ability to articulate what's in it—they never even use the program.

It's a very different problem that Sun is trying to address as they go down there. But on the other hand, I do believe that they have a better product.

With the Personal Iris, you're going into new distribution channels yourselves, aren't you?

Well, not really. To some degree that's true in some of the dealer development. We're getting into some of the channels that companies such as Sun have had going for a while, and we're being reasonably successful at that, but by and large it's still using our direct sales force and selling larger numbers to our big current accounts and to new accounts as they open up.

We are now at a point where Sun was in price a couple of years ago. I'd like to say something about price, though—a lot of people say, because we're at the same price, "oh, you must be competing with Sun," or "you must be competing with so-and-so" All I have to do is point out that you can buy a $15,000 motorcycle or a $15,000 pickup truck—they're not the same product, they're not the same market. We have a $15,000 3D machine, and it's going to have some overlapping capabilities with a 2D machine, such as the one Sun sells. But they're really very different products.

Eventually, I think there'll be some conflict in the market, but at the present time we don't see much.

How are you planning to keep your edge?

Aggressively developing software packages that really use 3D so that we offer something that's distinctly visibly different. That's the nice thing about graphics, it's visible. Distinctive. So the key is getting people to make the transition from the flat earth society into the world of 3D.

Is there any overlap between the NeXT's market and yours?

Personally, I think the NeXT has just sort of come along too late. It'll be a modestly successful company, but I don't think there's any way it would ever be a successful enough company to be a real threat to any of the current workstation companies or personal computer companies.

Do you agree with Scott McNealy that it was a bad idea not to make it a RISC machine?

Yeah. I agree with everything he said there, actually, in that particular line. Just a bunch of mistakes. I mean, why use a non-standard operating system?

And the 68030 is relatively old news at this point.

Oh yeah, that was a bad mistake. And part of the reason for Mach was that [Jobs] viewed it as something that fit what he saw as a need—it kind of fits in the whole scheme of the object-oriented world. And it's a university-based system, and ostensibly he's after the university market, so he says. Of course he's also smart enough to realize that there's a lot of follow-on from the university market.

Sure. Look at the Macintosh.

Yes. But there was just mistake after mistake. Probably the biggest one being, being so late.

And it's not done being late yet.

I think he understimated the amount of work required to get it there, the amount of money that was going to be required to get it there, and there's no reason why, if Sun does the job that they should do, they shouldn't just totally blow him out of the water.

I don't see him as a threat to us. He's got some designs on some aspects of what we do. He sees the value of what we do—Steve's a pretty insightful guy, he sees what's going on here. But his ability to pull off that plus all of the other things he's doing is—I'd say it's very unlikely.

We don't think about NeXT. We don't worry about NeXT. Hardly ever think about them any more, especially since he isn't shipping. Once he starts shipping, I think there'll be something you can look at.

Steve's name is only going to carry him so far. The rubber hits the road someplace out there. (laughs) ■

Getting More Power From Laptop Computers

By Wayne A. Yacco

Many users already have older machines that are ready for a life saving transplant. Other users are finding that the easiest way to get into the laptop game is by buying an older unit, either used or liquidated. A lot can be done with those machines, given the right accessories and software.

Little computers are getting to be big business. According to some reports, laptop computer sales are doubling each year. It's quite possible that laptop portables may begin to replace larger stationary machines in some applications. Compaq's newly announced SLT, the NEC ProSpeed 386, and others have designs on the desktop. Those machines have connections that can be attached to docking stations on the desktop. They give their users most of the features of a typical stationary machine, including connectors for adapters, without sacrificing portability.

But, at any particular time, most of the laptops in use are representative of a slightly outdated technology. Each new generation of machines is lighter and more feature-filled than its predecessor. So, as they grow older each year, the base of installed laptops is constantly becoming more outdated.

While the newest laptops may have advantages over the ones that were sold last week, however, users don't need to turn their classic machines into paper weights, door stops, or boat anchors just yet. There are ways to get those reliable old machines working better than ever. Even their working weight can be reduced. Here's how.

Unless you're willing to sacrifice some essential part, bulk or weight reduction is usually limited to the accessories that are carried with your machine. But that can result in some significant savings. Since laptops ultimately must derive their power from the software they run, reducing the bulk of software effectively reduces the weight of the system. Taking along all of the disks and documentation included with four or five major packages could easily outweigh the hardware several times over.

Power Through Software

Selecting the right software can benefit laptop users, particularly the users of earlier models which don't have hard disks, powerful processors, or full 640 K memories. Programs like Microsoft *Works* and *WordPerfect Executive* have a broad range of integrated capabilities; not only can they run on smaller machines but, for most field work, can replace larger and heavier collections of programs. Naturally, the features are somewhat reduced in these programs when compared to their larger counterparts. For example, *WordPerfect*'s ability to recover from mistaken deletions with the F1 key is absent from *Executive*'s word processor. Still, these programs are generally more powerful than the built-in software that is provided in the ROM of some machines.

A second major benefit users get with these packages is an interface which is roughly or nearly identical to one that they already know. The similarity is strong enough to essentially eliminate the need for training and the carrying of extra documentation.

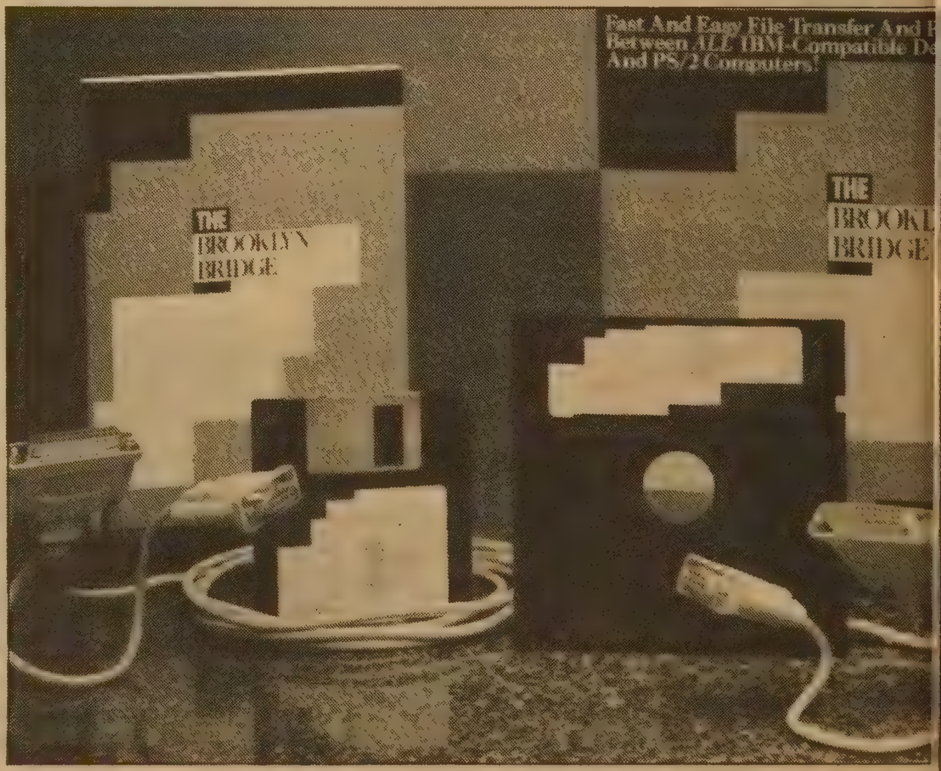
The cost of these packages is fairly reasonable. At $245, the price of *Executive* is a small fraction of what it would cost to buy all the WordPerfect products from which it incorporates features: *WordPerfect*, *PlanPerfect*, and *Library*, plus some desktop utilities and communications. (I suspect, though, that WordPerfect president Alan Ashton's personal copy of *Executive* has the undelete capability restored.) *Works* is just $149 for word processing, spreadsheet, database, and communications capabilities. The spreadsheet is very similar to *Excel*, and the word-processing features should be reasonably familiar to users of either Microsoft *Windows Write* or Microsoft *Word*, although it isn't quite like either.

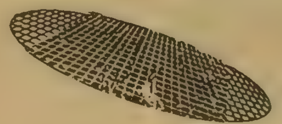
Software that runs on floppy-based laptops is not restricted to packages with limited capabilities. However, the same features that give large packages their power tend to make them run slowly from floppy disks, especially when frequent disk changes are required. An acceptable response time may also require more processing power than an 8088-based machine can deliver—and processors can't be upgraded in any of yesterday's laptops.

The spelling checkers and thesauruses that accompany products like Microsoft *Word* or *WordPerfect* are examples of such useful but cumbersome features. Many users will find it preferable to choose a word processor without a built-in thesaurus and carry a stand-alone electronic thesaurus instead. For example, the *Word-Finder Dictionary-Thesaurus* from SelecTronics offers a large Thesaurus/Dictionary that perfectly complements a program with only a small built-in dictionary. The $100 device weighs just a few ounces and fits enough ideas into a shirt pocket to make carrying it really worthwhile. It is also ideal for spelling the occasional word that smaller checkers miss, or for overcoming the lack of page or individual-word checking in programs like Microsoft *Word*. Having to re-enter words using its QWERTY keyboard is a slight disadvantage which is more than outweighed by the ability to use it with or without a computer.

Connections

It is also possible to harness the power of most desktop computers with just about any laptop, even if it doesn't have its own docking stations. Traveling Software offers a line of software products that connect laptop and desktop machines to each other over standard RS232 serial ports using a null-modem cable. This allows computers to communicate





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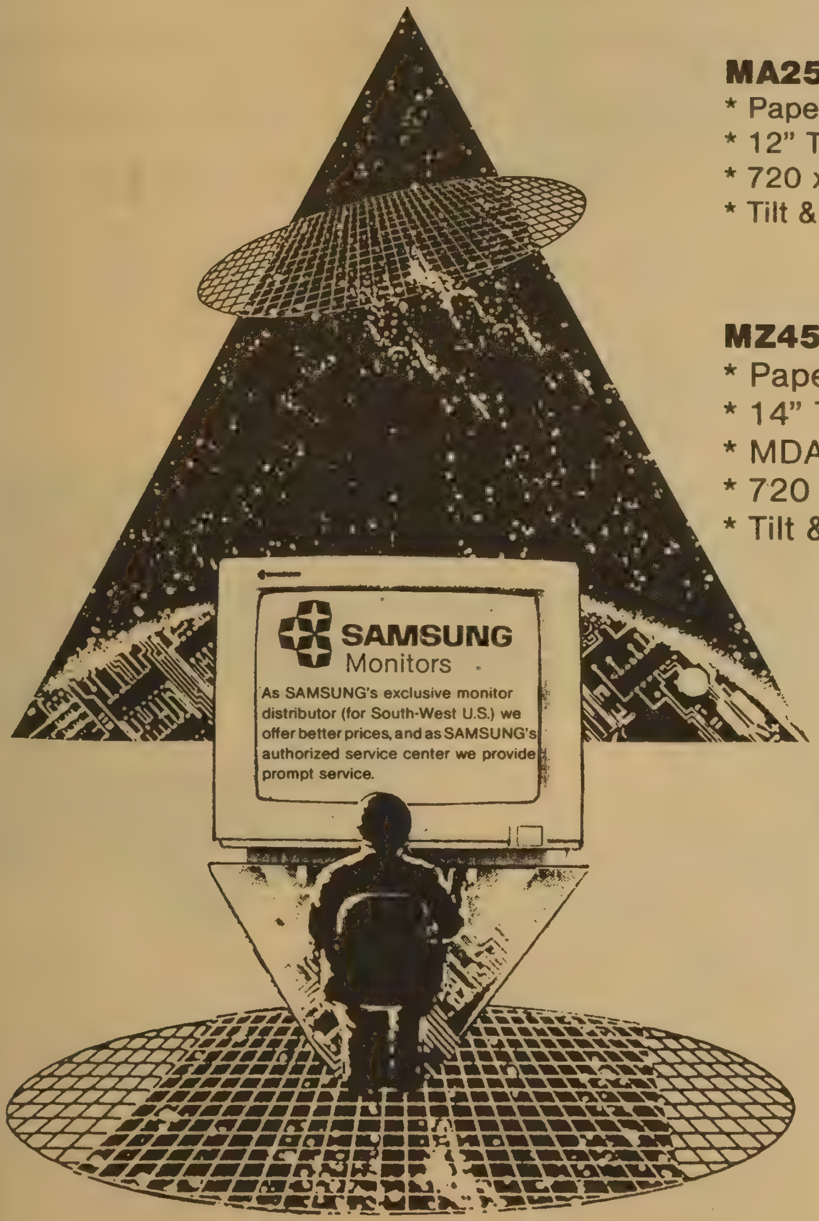

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easily even if they have different diskette formats. LapLink ($129.95) and LapLink Plus ($139.95) connect two IBM-compatible computers for file transfers (Plus adds the ability to access remote printers and files on remote hard drives; for $169.95, *DeskLink* also connects machines via the serial ports but with modular telephone wire. It allows the machines to be farther apart, provides background operation and access to remote printers and hard disks). There is also a version, LapLink Mac which will connect an IBM-compatible, laptop or desktop, to a Macintosh ($139.95). Many similar products are available: PC Hooker Plus, The Brooklyn Bridge, File Shuttle, Fastwire II, Rapid Relay Easy and The WEAK Link, to name several. Traveling Software is also an excellent source for all types of software and accessories for laptops through a catalog it publishes. The Traveling Software Catalog is dedicated almost exclusively to products for portable computing.

Hardware Upgrades

Most of the upgrades that increase a laptop's power are hardware revisions or additions. One way that laptop hardware can be upgraded is with expansion memory. Extra memory is often used by laptops to provide RAM disks which can replace a missing internal drive. The 768 K memory upgrade ($399) for the Toshiba T1000, which can only have a single internal drive, is designed for use as a virtual disk and includes battery backup to keep its data from being lost during a reboot. Because electronic disks weigh less, take up less physical space and don't require cables (like external drives), they are ideal for machines that must travel. Their biggest disadvantage is eventually you'll have to take the time to move their contents to a physical diskette.

RAPID RELAY
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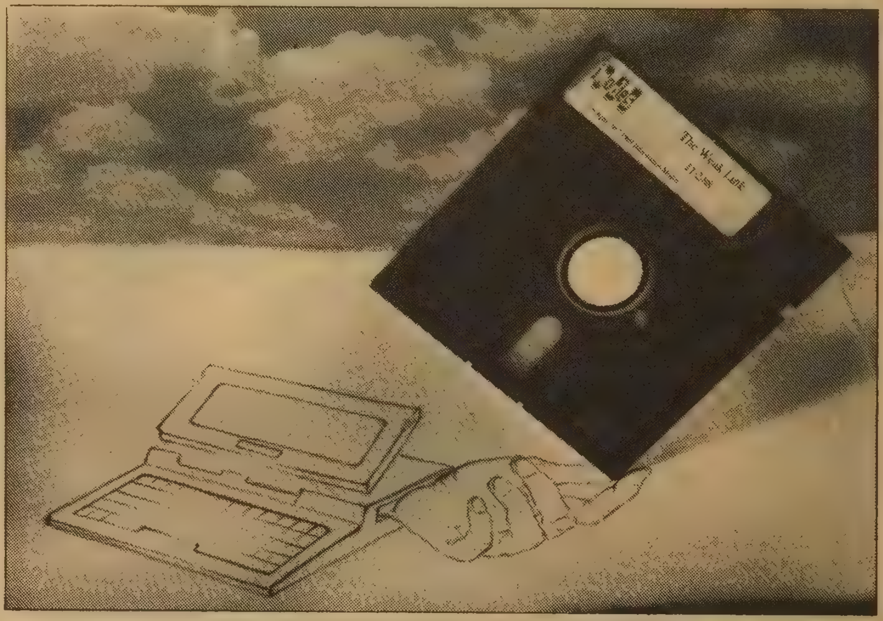
Some upgrades will overcome limitations that are built into laptops to save space and weight. For example, laptop keyboards often omit a separate keypad in their quest for minimalism. Instead they provide a function key that maps the numbers onto some of the alphabetic keys. It works but it isn't very ergonomic. External keypads can make it feasible to productively input large amounts of data.

One of the most significant limitations in early laptops was the display. Later versions solved the problem with super-twisted crystals and/or backlighting. The original NEC Multispeed is an example of a laptop that had a reasonably good twisted-crystal display which can be upgraded with an even better plug-compatible electroluminescent replacement.

Replacing the display on the Multispeed is as simple as snapping off a cover, squeezing two releases and pulling out the display's connector. A single flat cable must also be disconnected. Once the old display is removed in this manner, the new display is installed by merely reversing the procedures. Although there are some slight differences in the connections, they are completely compatible. The new screen weighs slightly more and dramatically reduces the time that the machine will run on its batteries. Also, it costs $499. But the benefit is a laptop that is much less fatiguing, and more productive, under most lighting conditions. With the upgrade, the Multispeed can also be used in poor lighting for the first time.



Upgrades which require equipment to be opened often must be installed by the vendor or the vendor's authorized service centers. Upgrades for the T1000's memory or modem fall into this category. There's a good reason why manufacturers don't want most users working inside their machines. Most portable machines use C-MOS parts rather than the more power hungry N-MOS used in the average desktop system. Aside from having different operating characteristics, C-MOS is also significantly more susceptible to damage from static electricity than the parts most of us are used to handling.

Furthermore, some upgrades like the Multispeed's EL display have required professional service even though the machine remains closed. According to NEC, that's because early versions of the Multispeed had 1.0 amp power supplies that can't serve the backlight. They need to be replaced with a 1.5 amp version. It is possible to order the screen and do it yourself if your Multispeed has the larger power supply that was shipped with later serial numbers.

The Multispeed can also be field upgraded by the user who needs a modem. Even Multispeeds that were originally ordered with 1200 bps modems can benefit from the faster 2400 bps model which came later. To install a modem in the Multispeed the user only needs to snap a small cover plate off of the left side of the unit. The cover has two knockouts for the modular telephone connections and volume control. The knockouts are easily broken and removed. The modem slides into the unit until it engages its connectors, and then the cover is replaced to complete the job. The 1200 bps modem sells for $399 and the 2400 bps model for $499. Toshiba's original 1200 bps modem for the T1000 ($299) will also have a 2400 bps replacement ($399) in February.

Third parties are also offering hardware upgrades for laptops. One of the most desirable is a hard disk. Because of space limitations, these products typically must replace one of the internal floppy drives on a two-floppy system. And, because of space or power limitations, not every laptop may be able to accommodate a hard disk. The T1000, for example, has room for only a single drive. The NEC UltraLite, Cambridge Z88, and others

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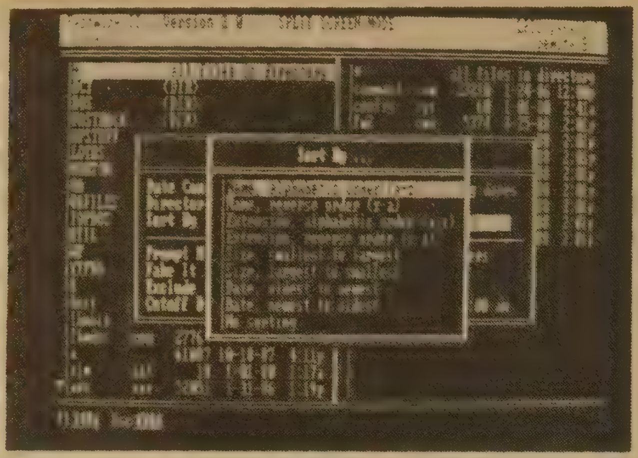

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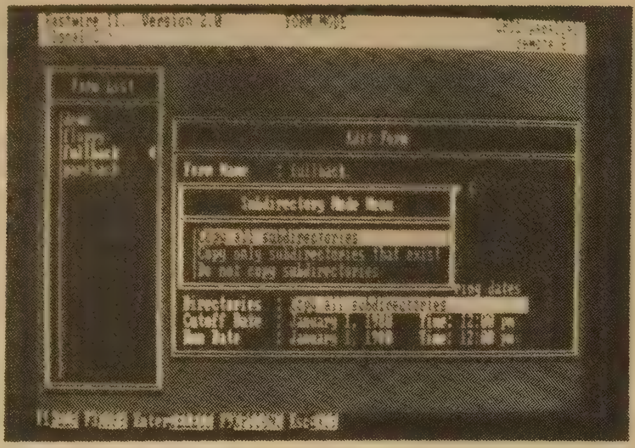

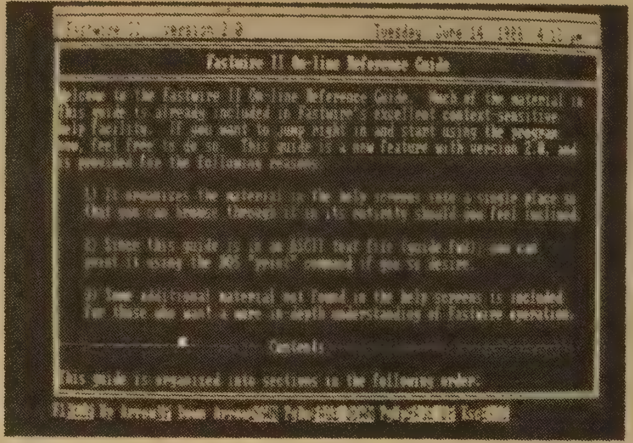

have no drives whatsoever.

CMS produces its 20 Mb LiteDrive hard disks for two laptops: the T1100 Plus and the Tandy 1400 Lt, LiteDrive. Both list for $1000 plus installation. The controller for the LiteDrive takes up the machine's modem/expansion slot, so users must use an external modem with these options.

There are also some upgrades that are difficult or nearly impossible to obtain. The Sharp 4500 series laptops, for example, are promoted as having the ability to store programs in EPROM. That saves memory, leaves more room for on-line data in the floppy drives, and lets applications start running faster.

However, it can be unreasonably difficult for the user to have software installed in the EPROMs. Sharp doesn't want its users to do this for themselves although EPROM burners are inexpensive, widely available, and easy to use. Instead, the user is expected to turn to the dealer who sold the machine. That's usually acceptable for users who purchase their machines locally, but can be an onerous task for mail-order buyers.

Sharp laptops are widely sold through heavily discounted direct-mail offers. The mail-order buyer may be expected to send fragile and expensive software to a dealer who could be less than enthusiastic about burning in a package that was purchased elsewhere. Sharp enforces this policy by withholding the necessary documentation from the end user of its laptops.

Another example is a replacement for the 720 K drives that came with many laptops. Replacing 720 K drives with 1.44 Mb drives would effectively double the storage capacity of a laptop at a very low cost. Some machines that run versions of DOS above 3.1 could already support 1.44 Mb drives. However, the compact interiors of laptops require replacements to have their connectors in exactly the same locations as the original drives. Likewise, faceplates are not usually interchangeable. So a replacement drive is essentially limited to one with precisely the same exterior design as the one being replaced. Worse, laptop drives may have unique designs that are unavailable in a high-density version.

For the user, upgrading a floppy drive will probably mean searching for the drive on a hit-or-miss basis with some chance that there won't be a replacement at all. The vendors who manufacture the drives may feel that they owe their first allegiance to the OEM customers who buy their drives. The number of drives they would sell couldn't begin to compare with the business they do with NEC.

Fortunately, the majority of desirable upgrades are available and more are coming. Nearly every laptop will be a candidate for at least one eventually. Laptop features due in the near future include high-resolution color-LCD displays, two-inch hard-disk drives, 3.5" floppy disks with 20 Mb capacities, SCSI ports, and built-in cellular-phone modems. There may even be a version of the Private Eye for laptops. That's a still-experimental display device which weighs about two ounces and is held in front of one eye by a headband. Its high-resolution images appear to be floating in space a foot or two in front of the user. And the user can see the image while coordinating the movements of hands, keyboards and pointing devices. Some or all of these are sure to be available as upgrades.

Many users already have older machines that are ready for a lifesaving transplant. Other users are finding that the easiest way to get into the laptop game is by buying an older unit, either used or liquidated. A lot can be done with those machines, given the right accessories and software. ■

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Resources

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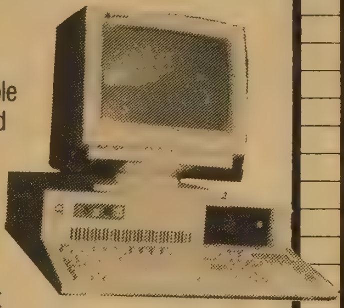

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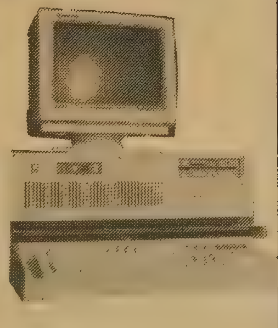

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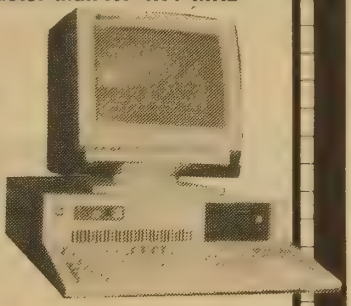

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14th Faire Brings Exhibits, Seminars To San Francisco

Garage Exhibit Of Early Computers Also Featured

The West Coast Computer Faire moves back to a familiar old location this year, Brooks Hall and Civic Auditorium in San Francisco. The Faire will last fewer days and have shorter hours than in the past, but attendees will be able to visit until 8 pm on Friday night, the first time the Faire has been open in the evening.

From Friday March 17 to Sunday March 19, over 375 vendors of hardware and software will display their merchandise at the Computer Faire. Products from every category and in every environment (DOS, Macintosh, UNIX, PS/2, etc.) will be featured at the event.

In addition to the exhibits and at no extra charge, there will be 47 conference sessions over the course of the show, featuring more than 100 industry experts. Networking, desktop publishing, and hypermedia will be major topics of these conferences. In keeping with the Faire's theme of "Legends of the West," a garage exhibit of early personal computers will be shown. Actual prototypes from Hewlett-Packard, Apple, and other firms that trace their beginnings back to a garage will be on exhibit.

Tickets to the 14th West Coast Computer Faire are available in advance for $10. Write to West Coast Computer Faire Registration Dept., 300 First Avenue, Needham, MA 02194.

WEST COAST COMPUTER FAIRE SCHEDULE BY DAY

Friday, March 17, 1989

Time	Session	Title
11:00-12:00	A-1	Keynote: Mainframe Power on the Desktop: Finally a Reality
12:00-1:15	B-1	Hypermedia Overview
12:00-1:15	C-1	Next Generation PCs
12:00-1:15	D-1	Desktop Publishing: Market Overview
12:00-1:15	F-1	What's Nu: Mac II Peripherals
12:00-2:30	I-1	Choosing the Right System
1:30-2:45	E-1	Operating System Debates
1:30-2:45	G-1	PC to Mac Connectivity
1:30-2:45	F-2	EISA vs. MCA and the Future of the '86 Family
1:30-2:45	H-1	Project Management
3:00-4:15	B-2	HyperCard Users Report
3:00-4:15	D-2	Desktop Publishing: Business Applications
3:00-4:15	E-2	Choosing Computer Languages: Understanding the Tradeoffs
3:00-4:15	F-3	Bit-Mapped Technology Trends
3:00-4:15	H-2	Databases
4:30-5:45	C-2	The Desktop Video Revolution
4:30-5:45	D-3	Desktop Publishing: What's Around the Corner?
4:30-5:45	E-3	Friendly User Interfaces Aren't
4:30-5:45	G-2	Small LANs: From Pie in the Sky to Pitfalls
4:30-5:45	H-3	Spreadsheets
6:00-7:15	J-1	Hands-On HyperCard
6:00-7:15	J-2	CASE for PCs
6:00-7:15	J-3	Software Development

Saturday, March 18, 1989

Time	Session	Title
10:00-11:15	A-2	The Impact of Viruses, Worms, and Trojan Horses
11:30-12:45	B-3	Tips for Stackware Developers
11:30-12:45	C-3	Interactive Technologies for Computer Entertainment
11:30-12:45	F-4	Shareware: A Valid Alternative
11:30-12:45	H-4	Word Processing Packages
11:30-12:45	H-5	Investment Software/On-Line Services
1:00-2:15	A-3	The World According to Pournelle
2:30-3:45	B-4	HyperCard Magic Tricks
2:30-3:45	D-4	Left Brain Desktop Publishing
2:30-3:45	F-5	Computer Games for the 1990s
2:30-3:45	H-6	Personal Information Managers
2:30-5:00	I-2	Setting Up a Home Office
4:00-5:15	D-5	Low-Cost CAD
4:00-5:15	J-4	Older Machines: Dusty But Not Forgotten
4:00-5:15	J-5	The Return of the Homebrew Computer Club

Sunday, March 19, 1989

Time	Session	Title
10:00-11:15	A-4	Mac vs. a World in Transition
11:30-12:45	F-6	Weird and Wonderful Gizmos: A Review of Notable Peripherals
11:30-12:45	G-3	Bulletin Boards, E-Mail, and Conferencing Systems
11:30-12:45	J-6	Professional Applications
11:30-12:45	H-7	High-End 386s
11:30-2:00	I-3	Your Kid and Your Computer
1:00-2:15	C-4	Voice, Music and Animation
1:00-2:15	D-6	Desktop Publishing for the Graphics Professional
1:00-2:15	J-7	Exotic Software
1:00-3:30	I-4	So, You Want To Be a Software Entrepreneur?
2:30-3:45	A-5	Where Do We Go From Here?

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- 230 W power supply and deluxe AT case

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- 16-bit hard/floppy disk controller
- one 1.2 MB floppy disk drive
- Gold-Star 12-in. high-res. amber monitor with monographics card and printer port
- enhanced-101 mechanical-tactile keyboard, AT/XT switchable
- 230 W power supply and deluxe AT case

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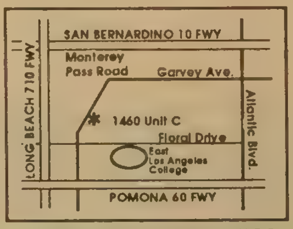

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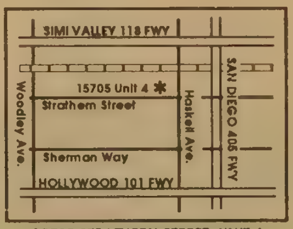

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MAC @ WORK

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No frills, no thrills, just a business accounting package that does what it's supposed to.

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Mac-PC Connectivity
By Robert Beauchamp
FoxBASE+ sets a high standard for Mac to PC connectivity.

Mac Accounting With Strictly Business

Little-Known Package Is The Small-Business Accountant's Choice

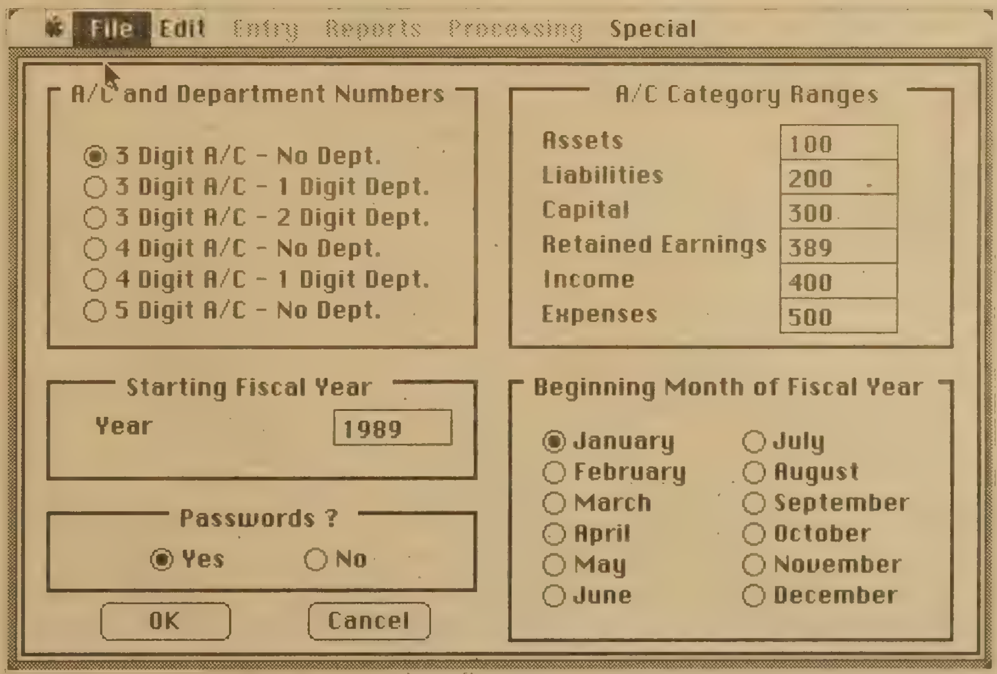
By David R. Satava

I got my Macintosh in May 1984. I fell in love with the Mac because I could perform word processing without reading a manual—never before had a computer been so user-friendly. Besides word processing, the Mac was excellent at desktop publishing, spreadsheets, and graphics.

However, it soon became apparent that the Mac and I were going to have a problem with respect to accounting. I just naturally assumed that the Mac could easily perform the number crunching and computational skills required to run my business accounting; the assumption proved unwarranted.

Over the years numerous software companies have made extravagant claims about their Mac accounting software, assertions that my accounting life would be made significantly easier. Promise after promise has been broken. I am confused, bewildered, and annoyed.

I don't want to go back to IBM and DOS, but I'm still looking for a Mac accounting package that works properly and lives up to its promises.



A/C and Department Numbers

- ● 3 Digit A/C - No Dept.
- ○ 3 Digit A/C - 1 Digit Dept.
- ○ 3 Digit A/C - 2 Digit Dept.
- ○ 4 Digit A/C - No Dept.
- ○ 4 Digit A/C - 1 Digit Dept.
- ○ 5 Digit A/C - No Dept.

A/C Category Ranges

Assets	100
Liabilities	200
Capital	300
Retained Earnings	389
Income	400
Expenses	500

Starting Fiscal Year

Year 1989

Passwords ?

● Yes ○ No

Beginning Month of Fiscal Year

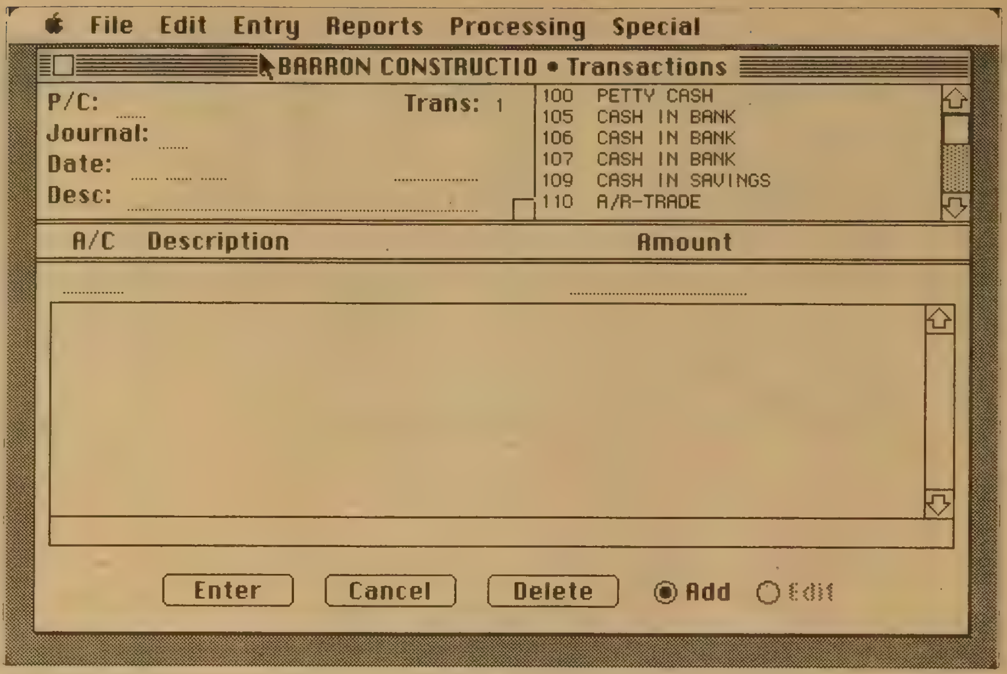
- ● January
- ○ February
- ○ March
- ○ April
- ○ May
- ○ June
- ○ July
- ○ August
- ○ September
- ○ October
- ○ November
- ○ December

Initial setup window: Strictly Business offers great flexibility in setting up the parameters of your accounting system.

Strictly Business gets about as much respect as Rodney Dangerfield. It's all business. No frills or thrills. Just reliable and straightforward.

The Twilight Zone Meets The Accounting Department

Of the Mac accounting packages I've looked at over the last four years, all but one have exhibited serious deficiencies. Some don't add numbers correctly; others don't utilize the Mac's features properly; still others don't retain all your data, or they let you change source documents, or they don't leave

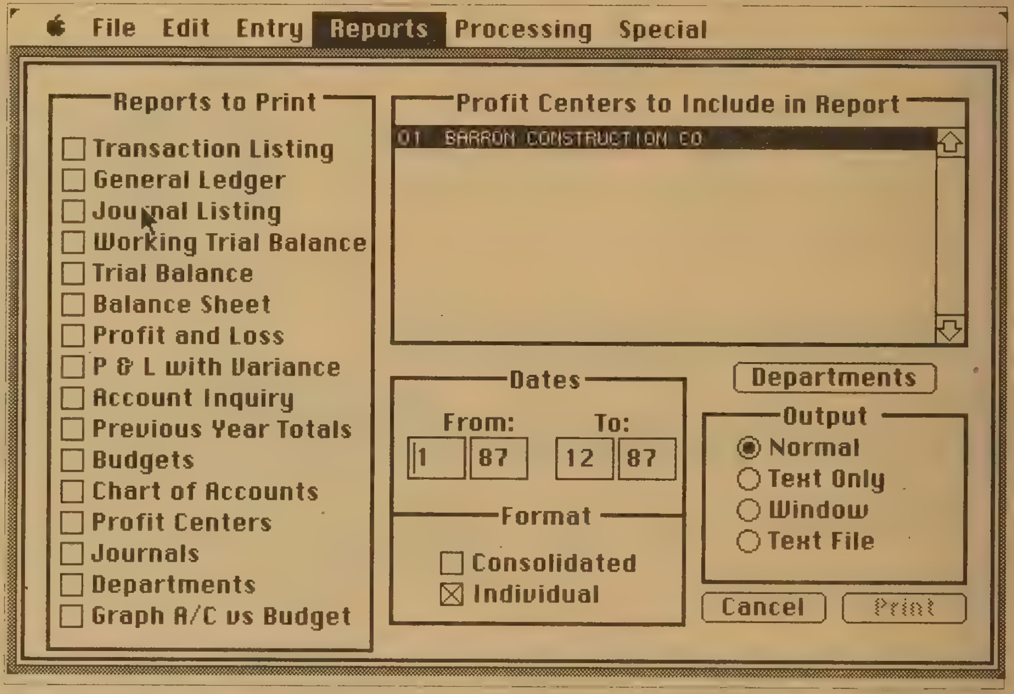


P/C:
Trans: 1
Journal:
Date:
Desc:

100 PETTY CASH
105 CASH IN BANK
106 CASH IN BANK
107 CASH IN BANK
109 CASH IN SAVINGS
110 A/R-TRADE

● Add ○ Edit

Data entry window: Data entry is simple and straightforward; a scrollable chart of accounts screen makes a variety of information readily available.



Reports to Print

- ☐ Transaction Listing
- ☐ General Ledger
- ☐ Journal Listing
- ☐ Working Trial Balance
- ☐ Trial Balance
- ☐ Balance Sheet
- ☐ Profit and Loss
- ☐ P & L with Variance
- ☐ Account Inquiry
- ☐ Previous Year Totals
- ☐ Budgets
- ☐ Chart of Accounts
- ☐ Profit Centers
- ☐ Journals
- ☐ Departments
- ☐ Graph A/C vs Budget

Profit Centers to Include in Report: 01 BARRON CONSTRUCTION CO

Dates From: 1 87 To: 12 87

Format: ☐ Consolidated ☒ Individual

Output: ● Normal ○ Text Only ○ Window ○ Text File

Report window: Strictly Business allows the easy generation of a wide variety of reports.

clear audit trails, or they allow out-of-balance financial statements, and other major accounting sins.

1 + 2 = 5? One of the earlier packages I reviewed couldn't add numbers correctly. Several years later, its enhanced version still couldn't add numbers.

This is commonly known as field testing. The company either hopes the problem will disappear after mailing or the user won't discover the problem. These companies are inhabited by the spiritual descendants of P. T. Barnum.

Wolves In Sheep's Clothing. When I was a kid, I remember cartoons of the wolves who would dress up in sheep's clothing. I always knew that they were fictional characters. But lately I've been reconsidering this premise.

One of the biggest problems to date has been the accounting packages ported over from the IBM world. Shades of Superman and the Bizarre world.

In order to get a quick foothold on the Mac Marketplace, these wolves in sheep's clothing have been presented as accounting Messiahs. These packages should be renamed "DOS on a Mac." One package I tested couldn't even use the mouse. These ported packages claim that eventually they will look and feel like a Mac. In the meantime, you will pay for each upgrade.

Happy (Audit) Trails. Many years ago Roy Rogers sang a simple but eloquent tune: "Happy Trails to You." Many people thought he was referring to horseback riding. He wasn't. He was alluding to the most important accounting concept of them all. The accounting process must leave a trail that is verifiable and traceable.

One highly-touted package doesn't retain or use all of the information or data you have to type into it. It only selects a small portion of data to be stored by the computer. This package acts more like a glorified typewriter. You must keep all of the computer printouts if you ever want to do any detailed analysis. The software acts like a road map, informing you which piece of paper has the information you need.

Why have a computerized accounting package if you must maintain and frequently use all of the printouts? If you thought your auditor was already unfriendly, wait until he starts down this audit trail. Worse yet, wait until you receive his bill.

Now You See It... One package even permits you to change the source document at any time. This means a report could be prepared, and all of the accounting evidence used to create the report could easily be altered and eliminated. One client I have loves this because she can always eliminate her mistakes. And so can her employees.

A superior accounting package would never let you eliminate records that have been posted. Subsequent correction entries are possible, but never the ability to eliminate an original source entry. This would never be tolerated by Roy Rogers. Rod Serling yes, Roy Rogers no. There must always be a trail detailing your trip from start to finish.

Tangled Webs, Or The Long And Winding Road. One of the first packages that I looked at lacked a cumulative general ledger. What this means is that if you wanted to review the history of one account you would have to wade through 12 separately-generated monthly general ledgers. Rod Serling would have loved this one also.

A World Out Of Balance. One package touted the great flexibility of the financial statement design feature. It was so flexible that it was easy to create an out-of-balance financial statement. This package violated the Italian accounting law that debits equal credits. Indeed, the package was flexible. Debits could exceed credits any time you wanted them to. The truly good accounting package will not permit this.

The Big Screen. I have always liked it when I could print a report to the Mac screen. This saves time and money. Unfortunately, two packages ported over from IBM couldn't retain what was displayed on the screen. For example, if you have a profit-and-loss report exceeding one page, you'd better have a photographic memory. You're going to need it. Once Page One disappears from the silvery screen, it's gone.

Have you ever seen a one-screen financial report? I haven't.

Windows. Accounting can be a complex process at times. It is therefore imperative for the user to move around various sections the program easily. Windows are the vehicle by which this is performed.

For example, if you need an account number, how easily can you locate it? One package I reviewed required the user to completely back out of the section he was in, locate the chart of accounts,

This package has numerous reporting features that can be viewed from the window, printed, or created as text only. In addition, a text file can also be created for exporting the data to other software.

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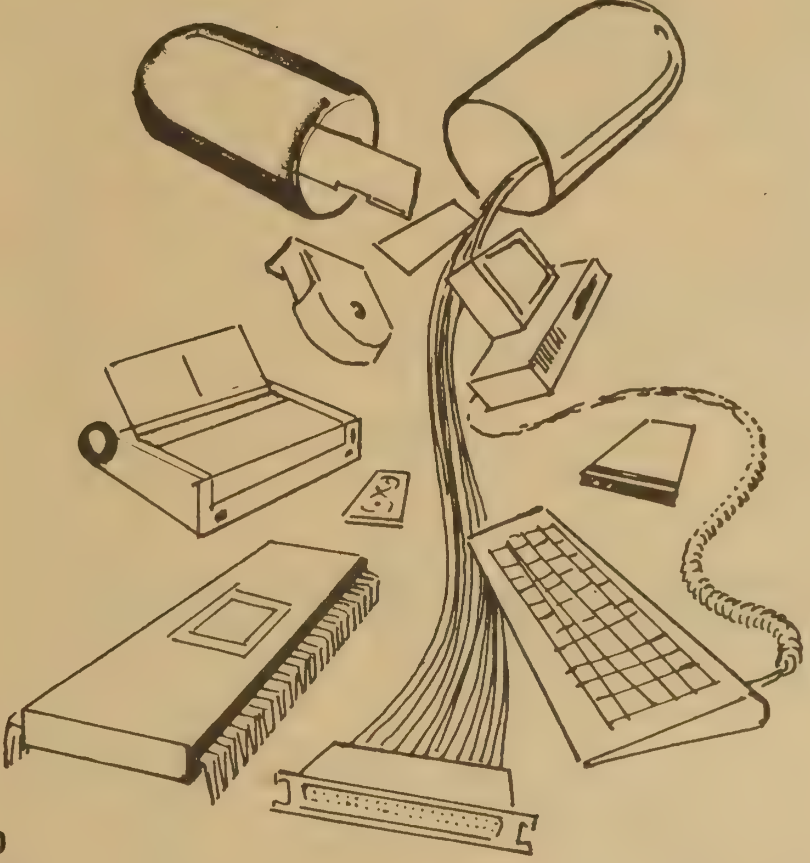

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and then return with the needed information. If it is a true Mac package, you should able to have several windows of information accessible at one time.

"Strictly Business"— Help On The Way

So, what do I want and look for in an accounting package? I want my business software to add numbers correctly and to be easy to use and Mac-like. It would be nice if the financial reports were in balance and visible on the screen. But most of all, I want the accounting package to pass my Roy Rogers test.

It's not that I am impossible to please. It's just that I perceive the future and wonder why it can't be here now.

The closest thing I've found to my dream software comes from a little-known company in Washington, Future Design Software. The package, *Strictly Business,* will not do graphics, nor does it prepare lunch or dinner. But if you are serious about your business, it will work well for you. Roy Rogers would love it; generally, though, my current software of choice gets about as much respect as Rodney Dangerfield. It's all business. No frills or thrills. Just reliable and straightforward. It currently includes a General Ledger module, the subject of this review; Accounts Payable and Accounts Receivable modules exist in a somewhat unfinished state.

A general ledger's function is to prepare the company's financial statements. This includes the balance sheet and profit-and-loss report. The general ledger takes all of the various accounting journals (accounting diaries) and compiles them into meaningful financial statements. These financial reports present the company's history using the language of business, numbers.

Many packages require the books to be closed on a monthly basis. Monthly closings reduce accounting details into forward running summary numbers The computer only retains the current month's details. If you have details to be reviewed, you will have to manually review previous computer printouts. This lack of a cumulative trail defeats the purpose for having your accounting on a computer.

Strictly Business's General Ledger module is cumulative; it permits you to retrieve the detailed source documents at any time during the course of the year—from the the software. There is no need to review the paper printouts. It also does not require monthly closings.

The accounting cycle can be summarized as setting basic parameters, designing the financial statements, entering the data, and budgeting and financial reporting. We will follow the accounting process as it relates to *Strictly Business.*

Setting Parameters. This screen requires that the chart of account ranges, profit centers, and departments be established. You have great flexibility in selecting your chart of account numbers: they range from three- to five-digit charts of account numbers with no departments to three digits and 100 departments, or four digits and 10 departments. The last feature is especially valuable for companies which want to keep track of the profitability of a product, division, etc.

Designing a chart of accounts from scratch is not difficult. The chart of accounts is the backbone of the financial statement, so you should design your financial statements prior to establishing the chart of accounts. This is important because, as we will see later, the financial statement design function only operates in numerical sequence.

For CPAs and bookkeepers, previously designed chart of account numbers can be retrieved and modified for new accounts. This is a great time saver.

The package divides the complete chart of accounts into six sections (assets, liabilities, equity, retained earnings, revenues, and expenses). This part is fairly simple except for one small area. Be careful to designate the cost of goods account numbers within the expense chart of account number range. If you include your cost of goods as a subsection of sales, you will not be able to have accurate percentages. This is not a fault of the package, but of the way many of us view cost of goods.

Designing The Financial Statement. The chart of accounts must be designed with the financial statement in mind. Because the design function utilizes the chart of account numbers sequentially, the importance of properly planning your financial statement design can't be overstated. If done correctly, the actual setup of the financial statements can be extremely easy. Within reason, you can design several types of financial statements. For example, you can have an internal statement that lists the accounting figures in great detail, while the banker's financial statement could be limited to displaying only the summarized figures.

Data Entry. This is the easiest section of them all and the place where most of the work is done. There is only one window for all of the data input. The data input section includes the following fields:

- Profit center (you can have up to 99)
- Journals (you can have up to 99)
- Date
- Check or journal number
- Description
- Account number
- Amount

At all times during the data entry session, you are able to access all other reports quickly. This is helpful if you have to review a previously recorded accounting figure before you enter the new information. It is also helpful if you want to create a new profit center, journal, or simply add another chart of accounts number.

A chart of accounts mini-screen is part of the main screen and can be scrolled. This screen can be accessed numerically or alphabetically. Each transaction can be split into their various components. This screen is a marvelous feature and permits up to 200 transactions prior to posting.

Reporting. This package has numerous reporting features that can be viewed from the window, printed, or created as text only. In addition, a text file can also be created for exporting the data to other software. This later feature was very useful this past tax season. Preparing 1099s for individuals who earned in excess of $600 is not one of my favorite activities. By turning the cash disbursements journal into a text file and transferring it to *Excel*, I was able to sort the checks alphabetically. Over 1000 checks were sorted in less than one minute; from this alphabetized list, I was able to quickly prepare the 1099s as required by law.

Another nice feature is the ability to prepare budgets. You can create a budget for each sales and expense category by month, months, quarter, or yearly. Variance reports can then be printed from it—budget comparison of like periods, expenses to date relative to the yearly budget, etc. These features are especially valuable for nonprofit organizations that live and die by the budget process. Since large firms have a mandatory budgeting process, it is a good idea for small firms to analyze the reasons they don't.

Strictly Business works logically and uses most of the Macintosh features. The strengths are the ability to quickly and accurately input data into the computer. The chart of accounts, departments, and profit centers can be expanded and adjusted in seconds. Financial statements can be prepared by month, months, or year to date. All the reports can be viewed on the screen. Many mainframes can't even do this.

In Conclusion

Strictly Business works logically and uses most of the Macintosh features. The strengths are the ability to quickly and accurately input data into the computer. The chart of accounts, departments, and profit centers can be expanded and adjusted in seconds. Financial statements can be prepared by month, months, or year to date. All the reports can be viewed on the screen. Many mainframes can't even do this.

The main weakness is the lack of the accounts receivable and payables module. This is not a major problem for new and small businesses which will never need more than a general ledger.

This is an excellent package and it works. (*Strictly Business* is available from Future Design Software, P.O. Box 9, Colbert, WA 99005-0009, 509/467-9282.) ■

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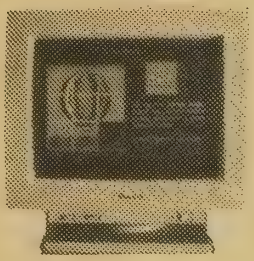

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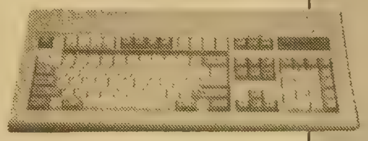

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MAC-PC CONNECTIVITY

BY ROBERT BEAUCHAMP

FoxBase+: Connectivity, Not Excuses

No Ifs, Ands, or Buts, FoxBase+ Offers True Mac To PC Connectivity

Even though connectivity is becoming a more important issue to software developers everyday, it is rare to find one who has more than a nodding acquaintance with the problem. It is extremely gratifying, therefore, to find a company that not only acknowledges and supports Mac-to-PC connectivity, but actually possesses a philosophy. And an uncompromising philosophy at that.

Fox Software, in its development of *FoxBASE+*, a database application for the PC and Macintosh environments, had a goal to achieve. It's clearly stated in the software's documentation: "*dBASE III Plus* and *FoxBASE+* applications from DOS must work immediately and perfectly under *FoxBASE+/Mac* —no sweat, no excuses." I don't know what it is that gets you excited about computers, but that attitude just warms my heart.

You shouldn't make the mistake that *FoxBASE+*'s biggest draw is connectivity, however. *FoxBase+* in both environments is a powerful database with impressive features. Connectivity is only one of its multitudinous attractions.

FoxBase+ in both environments is a powerful database with impressive features. Connectivity is only one of its multitudinous attractions.

As we discussed last month, there are three basic paths you can take in order to move your database from one environment to the other. The first, and most common, is to reconstruct your database structure in your new application in the new environment. You must carefully duplicate the database's fields and their formats. Then you have to take the data from the old database as a text file and place it in your new database, hoping everything fits the way it should. If it doesn't, you massage it until it's right.

The next, and more elegant method, is to take the database and place it, in its entirety, into a compatible application in the new environment. For, example, you can take a database created in *dBASE III Plus* and open it up directly in *dBASE Mac.*

The third, and most impressive path, however, is to be able to take *applications* you've created using your database's programming language and moving them lock, stock, and barrel into the new environment. This is what *FoxBASE+* allows you to do.

CONVERTING FILES

dBASE III Plus programming creates a number of different file formats. Because of the differences between the PC and Macintosh environments, *FoxBASE+* and *FoxBASE+/Mac* handle the conversion of these files differently.

Converting *dBASE III Plus* files to *FoxBASE+* is extremely easy. Since *FoxBASE+* is source compatible with *dBASE III Plus*, all you have to do is open up the file exactly as you would if you were using *dBASE III Plus.*

The file formats that *FoxBASE+* will use are: .DBF, databases; .DBT, memo files; .MEM, memory variable save files; .FMT, screen format files; .FRM, report format files; .LBL, label definition files; and .PRG, source programs.

FoxBASE+ needs to recompile your .PRG files before it can run the programs you've written. It can do this "on the fly" when you run the program. It is recommended, however, that you recompile the .PRG file with the batch file **foxcomp**, included in the package. This will make your source programs run faster and will reduce their loading times.

The only other exception to this open and go formula is found when using dBASE style index files. *FoxBASE+* indexes are smaller than *dBASE III Plus* indexes. When *FoxBASE+* encounters a *dBASE III Plus* index it automatically rebuilds it. New index files will be given the extension .IDX.

Converting dBASE III Plus files to FoxBASE+ is extremely easy. Since FoxBASE+ is source compatible with dBASE III Plus, all you have to do is open up the file exactly as you would if you were using dBASE III Plus.

FoxBASE+ On The Mac

While *FoxBASE+*'s file conversion feats are pretty impressive, what makes it a real connectivity winner is the Macintosh version.

Taking a staid old *dBASE* file and turning it into a razzle-dazzle *FoxBASE+/Mac* file is easy as double-clicking your mouse. This task is made possible with *FoxBASE+/Mac's* excellent use of the Macintosh's graphic interface.

FoxBASE+/Mac takes the files you've created in *dBASE III Plus* and automatically converts them to the *FoxBASE+/Mac* environment. The first time you want to use one of these files you have to open it while in *FoxBASE+/Mac.* After that you are left with a nice Fox-faced icon. As with any Mac file, double clicking the icon opens up the file and application simultaneously.

Using *FoxBASE+* on the PC can be rather intimidating. It presents you with the command line like a faithful centurion waiting patiently for orders. But what orders to give? An extensive help menu provides aid, but it definitely is an environment for the serious database programmer.

FoxBASE+/Mac, on the other hand, easily lends itself to the weekend database warrior. Its menu selections invite you to explore the world of data-

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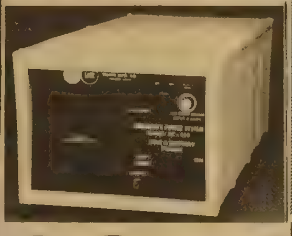

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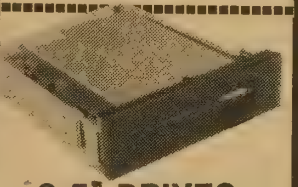

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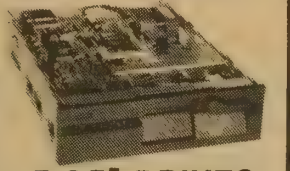

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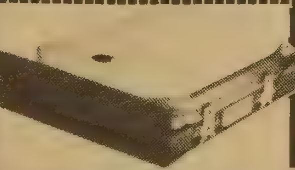

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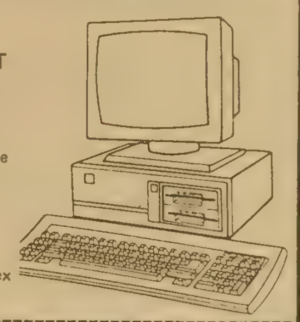

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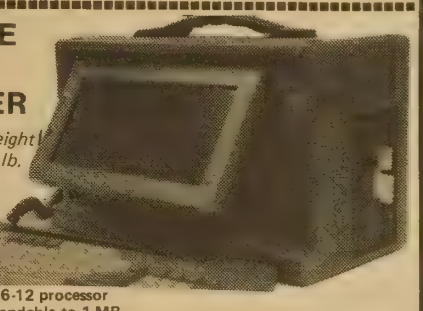

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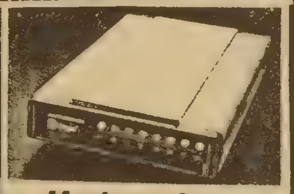

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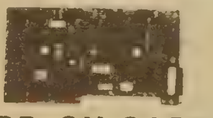

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IBM PC XT, AT are registered trademarks of International Business Machines Corp bases at a leisurely pace. It allows you to browse through databases to get acquainted with them. Then, when you wish to change them around or create new databases, you can use those familiar tools to point and click your way to the database of your dreams. While *FoxBASE+/Mac* lends itself to the beginner, it is in no way a low end database. It is as powerful as its PC counterpart and still manages to be easy to use.

When you do get into the more complex features you'll find a relational database that makes it easy for your databases to relate. With a few ingeneious commands you can get multiple relations in a database program with a minimum of programming. Other advanced features that are supported are user-defined functions and memory variable arrays.

While *FoxBASE+/Mac* is extremely compatible with *dBASE III Plus*, there are a few *dBASE* features it doesn't support. These will be important to you depending on how much you use them in the DOS environment. *FoxBASE+/Mac* doesn't support CATALOG, IMPORT/EXPORT, and suprisingly, for a connectivity masterpiece, there is no suport for DIF, SYLK, and WKS file formats in COPY and APPEND.

One feature that any Mac user will love is *FoxBASE+/Mac's* new picture data type. It is stored in a .DBT file and is much like a memo field in that you can't edit or manipulate it within *FoxBASE+/Mac*. Picture data can, however, be displayed like any other field on the screen. You can also determine the size at which your graphics will be displayed. There is even a way to use them as input buttons.

If you do find yourself missing your PC's unfriendly interface, *FoxBASE+/Mac* has included a piece of shareware from Frank Nichols of Westerville, Ohio, called *IBMKlone*. Useful for those creating documentation for IBM products, *IBMKlone* is a PostScript font that replicates the IBM PC font on the Macintosh. This way if you import a file from the PC the characters will be displayed correctly. Those characters that the Mac does not recognize won't be modified, and you won't have to do as much cleaning up after a file transfer.

Conclusion

While *FoxBASE+* and *FoxBASE+/Mac* demonstrate their obvious connectivity charms with ease, there is one charming area that might not be readily apparent. A program like Microsoft *Word* offers a connectivity solution by allowing you to transfer files neatly back and forth between the PC and Mac environments. You still need, however, to buy *both* versions of *Word*. With *FoxBASE+/Mac*, however, you can jump right into the connectivity field and only purchase *one* new application. *FoxBASE+/Mac's* ability to convert *dBASE III Plus* files directly means you don't have to buy *FoxBASE+* on the PC to have your connectivity solution. While you may become so enamored of *FoxBASE+'s* features that you'll eventually want to own both versions, at least you aren't forced into a huge investment, or forced to forgo connectivity because it's too expensive. ■

> **With FoxBASE+/Mac, however, you can jump right into the connectivity field and only purchase one new application. FoxBASE+/Mac's ability to convert dBASE III Plus files directly means you don't have to buy FoxBASE+ on the PC to have your connectivity solution.**

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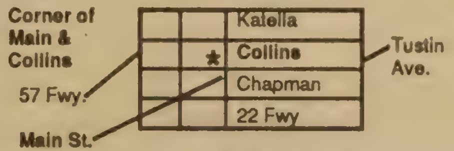

AMIGA

BY MATTHEW LEEDS

Aegis Sounds Off

All work and no play can ruin anyone's attitude. When I started using computers it was for play. Now it seems like it's all work. I've got a full-time job with a software company where I use Macs and PC clones all day long. When I get home at night I work on a book I'm writing, using an Amiga. Every now and then I get to play with new software, just play.

Other folks like to play computer games, shooting down MiGs or wandering through an unknown land discovering magic spells. I like to explore new software, looking for elegant user interfaces, extraordinary new features, and a remarkable understanding of what it takes to have that perfect Amiga feel.

I recently received a copy of *Audiomaster II* from Aegis Development. I'm not a musician, but I've been having a lot of fun playing with *Audiomaster*, making new and unusual sounds out of everyday noises. *Audiomaster* is a digital sampling system (you'll still need a hardware sampling device) that handles both mono and stereo. It has a waveform display, similar to an oscilloscope where you can edit and modify a sound sample.

Audiomaster handles the standard cut, copy, and paste functions you would expect in any editor, but it goes much further than that. You can apply low pass filtering; adjust the volume, pitch, and numeric sampling rate; set the loop points; automatically find the best loop point; and save samples in IFF mono, IFF stereo, or Sonix formats.

Now I'm sure that for some of you all of this makes *Audiomaster* sound like a great tool for some music project you need to finish, or the ideal program for creating sampled speech files; for me, though, it was exactly the right opportunity for some creative fun. I've got a small program that keeps an eye on my floppy drives, and when I insert or remove a disk it makes a sound. The sounds that came with the program were a "yum" when you insert a disk and a "yuck" when you eject a disk. I spent the better part of an evening making different sounds and trying them out. I ended up with a disk insert that was sampled from a James Brown song, and a disk eject that sounded like a toilet flush from hell. Great entertainment.

Audiomaster is a digital sampling system that handles both mono and stereo. It has a waveform display, similar to an oscilloscope where you can edit and modify a sound sample.

Aegis has also released *Sonix SoundTrax* Volumes One & Two, a series of interactive songs for Sonix. Each volume has two full disks of songs that make use of clean sampled instruments and careful selection of key placement so that sounding an off-key note is almost impossible. Aegis has also reinstated the Aegis-BBS. It offers support for technical questions, warranty and update information, product announcements, beta test information, product demos, and info on upcoming contests. The number is (213)399-7316 at 300/1200/2400 baud 8.N.1. Full color support is provided and ANSI terminal packages are recommended.

Other Software News

The Disc Company has released an upgraded version of *Kind Words* V2.0. The new version includes the 100,000-word *Merriam Webster Dictionary* and the *Merriam Webster Electronic Thesaurus*, which accepts over 40,000 words and offers 470,000 synonyms. For a limited time the new version is available at half price when you order direct and include the front or back manual cover of any other Amiga word processing program.

Also newly released by the Disc Company is *Superback*, a backup utility. It has one of the nicest interfaces I've seen on a backup program, and offers most of the features you'd expect or want. This would be a good choice for a novice user as it is very simple to use. It is a little less expensive than *Quarterback*, but not quite as powerful.

The upgrade to *Deluxe Paint*, version III, is in final beta testing and may be on the streets by the time you read this. Aside from the fact that EA has finally cleaned up the interface to work correctly (hard disks are now known as DH0:, it no longer asks for a disk to be put in DF1:, fonts are handled in a requester), a completely new area of functionality has been added. *DPaint* now does animation.

A set of screens can be loaded into memory and worked on individually. Brushes can be animated and stamped across the set of screens in memory. Also added is support for half-brite, wrapping a brush around an object, tint mode, painting in overscan mode, and a re-designed airbrush tool. EA has an upgrade path for current owners of *DPaint*; contact them directly for details.

Pick of the month for best public domain program goes to *Exploding Windows* by Ed Scherer. Tired of watching your windows open in the same old boring fashion? Try *Exploding Windows*. When you click to open a window now, you'll get a wonderful blur of motion; when you close a window you'll see it collapse into itself. Nothing useful but great fun.

Almost-pick of the month goes to *Surf* by Eric Davies. *Surf* is a program for producing bezier surfaces of revolution. It produces awesome pictures of wineglasses and doorknobs, and other objects one could turn on a lathe. *Surf* includes the capacity to map IFF image files onto any surface that it can draw. If you want to experiment with creating three-dimensional objects, this is a good place to start inexpensively.

Finally, mark your calendars for the start of the Amiga Developer's Conference, coming to San Francisco starting June 14th. No, you won't be welcome at the door (unless you've paid to attend) but there are plans afoot to take advantage of the presence of so many members of the Amiga community. Nothing has been firmed up yet, but discussions have revolved around a series of seminars, a trade show, a show-and-tell event, a multi-media event, and a giant party. I'd put my money on the last possibility. ■

RESOURCES

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Matthew Leeds has been involved in the high tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video, graphics and related fields.

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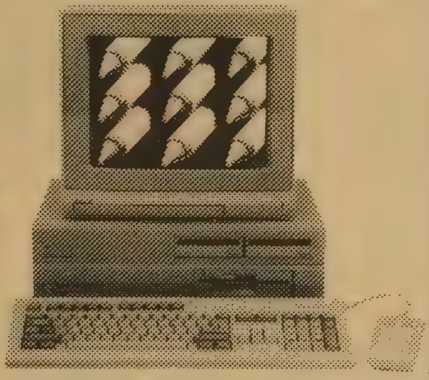

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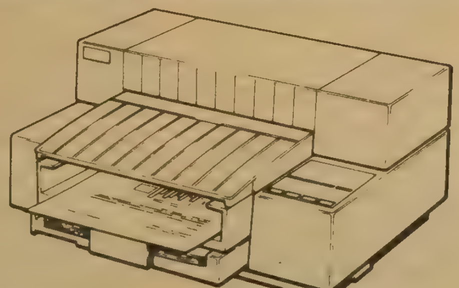

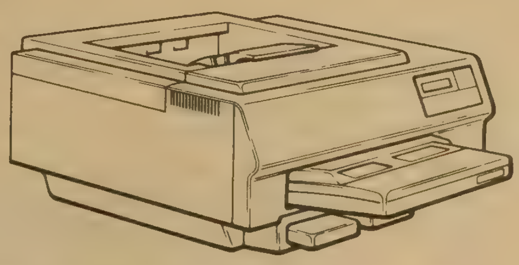

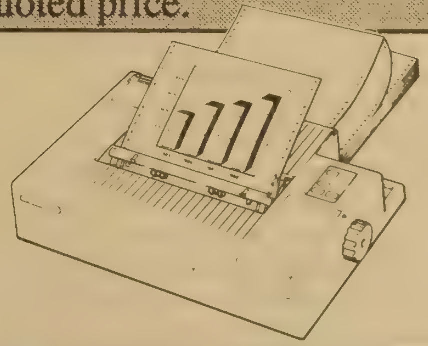

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USER GROUP NETWORK

BY MARY EISENHART

We've had a bumper crop this month of mail from BBS operators in Southern California, so without further ado, let's get to some of their letters.

But before we do, here's a not-quite-in-Southern-California resource your user group might want to know about: **The Official APCUG BBS.** APCUG is the **Association of PC User Groups**, and its official BBS went online on February 7. Sponsored by Borland International, Intel, Tymnet, and Dell Computer, the board is divided into three sections. Section 1 provides conferencing and email facilities to representatives of member organizations, allowing them to communicate with PC users worldwide, using their local Tymnet node. Section 2 allows user group officers to exchange ideas and newsletters; Section 3 is open to the public and contains forums provided by the board's corporate sponsors. Press releases, product information, and demos will be available for download.

Sponsors expect that more forums and features will be added in time as more users access the system. To log on, call (408)439-9367.

Matt Denny of Long Beach invites you to check out his bulletin board, the **Casus Belli BBS**. It offers shareware and public domain software downloads for both Mac and PC, as well as such features as play-by-email Diplomacy. It operates 24 hours a day at 3/12/2400 baud, 8-N-1, and has quick and easy user validation. Use your modem to call (213)595-1488 and check it out.

The Consumer & Business Network operates 24 hours a day at (818)360-4679. It offers a variety of features and information, including online shopping, real estate info, *USA Today*, business and financial data, and Mac downloads. The service is free for a period of 20 minutes per day per user; full service, which allows 60 minutes per day of access, is available for a modest charge.

John Altpeter of Long Beach is the proud sysop of **R U Board**, which runs on a Mac Plus. Says he: "I am the manager of an IBM Clone retail store and I plan to make this an active BBS with the help of many good people." The board offers a variety of discussions of subjects ranging from metaphysics to gaming hints, as well as Mac software downloads. It operates 24 hours a day, 3/12/2400, 8-N-1, at (213)428-4181.

If you can keep your language at a level that wouldn't embarrass your grandmother, you're cordially invited to check out the three-year-old **K & L BBS** in Torrance. **Louis Dubin**, one of the board's 16 sysops, emphasizes that "We do *not* allow profanity." What they do allow, however, is 35 public discussion areas, online games, file transfer (the board runs on an Apple II and supports IBM, Apple, Amiga, and Commodore) and voting booths. The board operates 24 hours a day and has both young people and adults as regular users—about 250 currently, according to Louis. The board is free, and users are allowed 60 minutes per day of access; new users are required to supply their real name, address, and phone number before being validated; the information is verified by a voice phone call. The K & L board awaits you at (213)327-2255.

In user group news, we hear from **Harley Ristand** in LA, who's the president of the **Amstrad Users Group, USA**. Harley says that he's discontinued the group's monthly meetings due to low attendance, coupled with the fact that "many I have helped by mail or phone said they wish they had known earlier that you didn't have to attend a meeting to get help." So now he supports Amstrad users free of charge via mail and phone, and asks only an optional $1 to help him with expenses.

A retired computer engineer from IBM, Harley picked up one of those bargain Amstrad PCW8256 "word processing" machines and discovered it had a lot of computer power not mentioned in the documentation. The path, however, was strewn with obstacles: "The PCW8256 uses a non-standard 3" disk which doesn't run on other computers; the operating system is the older CP/M which is incompatible with the newer IBM MS-DOS; the 'User Guide' is very difficult to follow. For these reasons I realized that a self-help group was needed. I thereuopon started a members-helping-members group, knowing that I also would be getting help. Need for the group further increased when Sears discontinued the Amstrad, which made us 'orphans.'" Among Harley's recent rescues: "I helped a member transfer his Amstrad *LocoScript* word processor files to an MS-DOS machine. I used a null-modem cable to transfer the files in batch mode at 9600 baud." So if your Amstrad files are driving you loco, Harvey may be able to help.

The group now has 134 members nationwide, and can be reached at Amstrad Users Group USA, 12741 Matteson Ave. #3, Los Angeles, CA 90066; you can also reach Harley by phone at (213)397-7981.

Atarians, whether of the 8-bit or ST persuasion, will want to know about the Atari Computer Enthusiast Society (ACES). It meets at Federated in the City of Industry, and you can get more information by calling Perry Robbins at (818)962-1530.

If you're one of the legions of people who work in law offices and use *WordPerfect*, you might like to know about a new information resource, **The Newsletter: Legal Word Processing With WordPerfect.** Published quarterly, *The Newsletter* addresses issues of concern to the beleaguered denizens of law offices, discussing such problems as line numbering, getting around the occasional bug in the not-quite-perfect program, interfacing with H-P printers, and dealing with the threat of viruses. **Kathleen Creighton**, who owns Professional Input Service, a San Francisco-based word processing service bureau, edits and publishes *The Newsletter* along with consultant **Robert Lauriston.**

If you'd like to subscribe to *The Newsletter*, send $36 (for a one-year subscription) to Professional Input Services, Inc., 740A 14th Street, Box 420, San Francisco, CA 94114. Or if you'd just like more info, call (415)864-7748.

We hope to see some of you at the Computer Faire this month—if you're around, be sure to stop by our booth and say hello. And keep those cards and letters coming! The US Mail should be directed to User Group Network, 5951 Canning Street, Oakland, CA 94609. The email, on the other hand, should be directed to **microx** on The WELL (415)332-6106 or to **{pacbell, hplabs, ucbvax, apple}!well!microx** if you're off in the further regions of the Usenet. See you next month.

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203

Terrapin Station. (203) 656-0134. Grateful Dead Board. Sysop: Klaus and Gretchen Bender.

209

Bertha Board BBS.(209) 239-9853, 300/1200/2400, 8-N-1, 24 hrs. MS-DOS, others. 95 Mb online. Emphasis on programming. Uploads and downloads. No fee but registration required. Sysop: Kenneth Roach.

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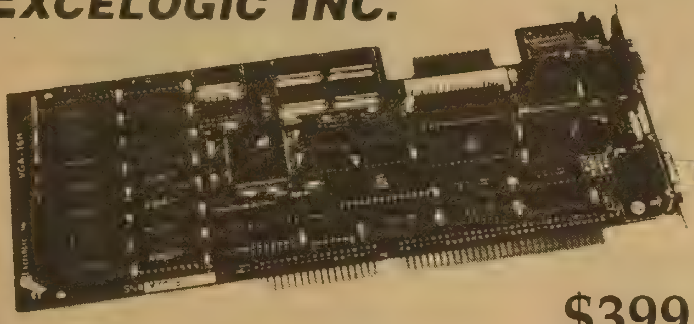

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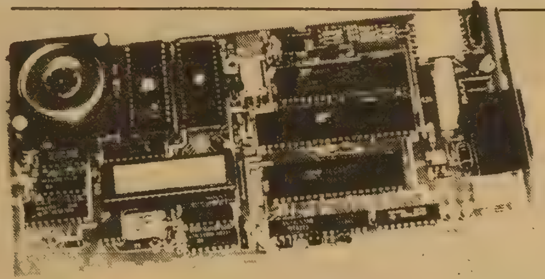

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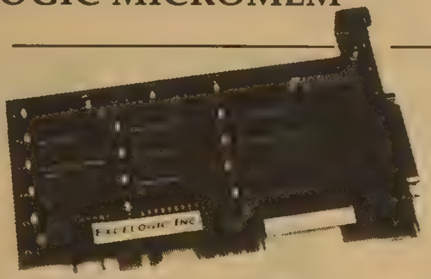

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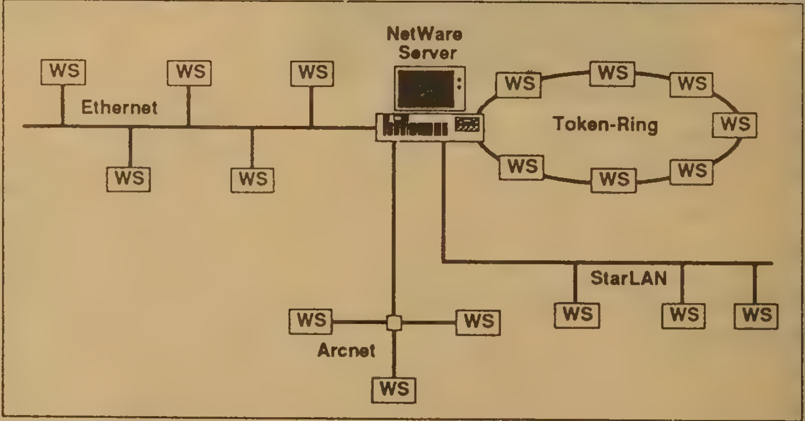

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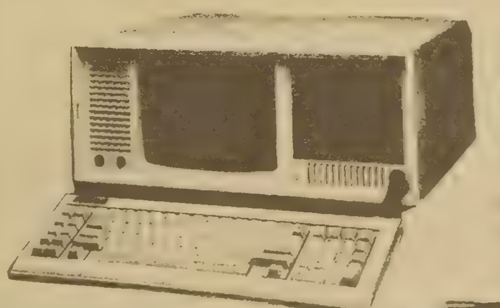

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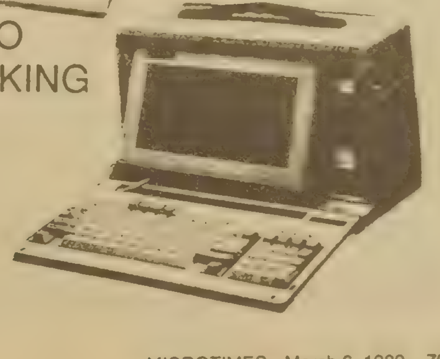

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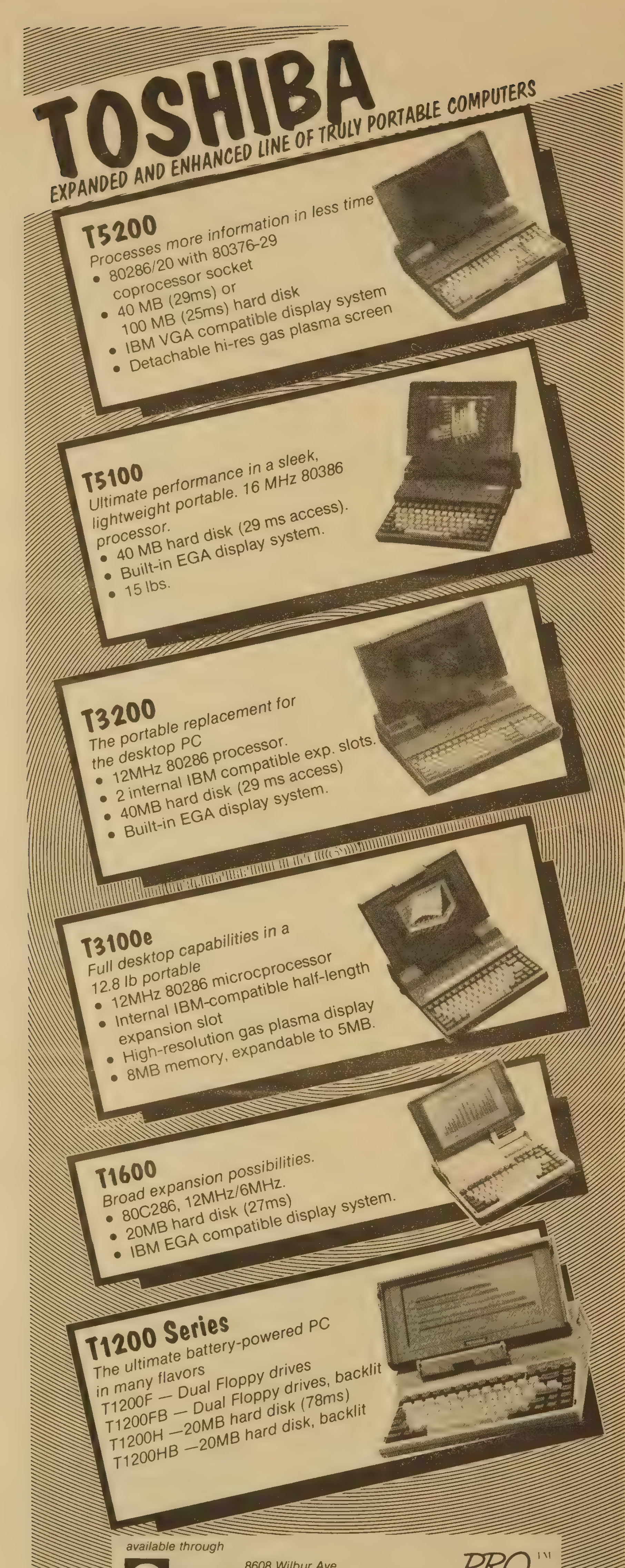
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Southland News. (213) 402-4079. 24 hrs. An online newsmagazine w/ general news, comments, entertainment, computer news show, club & swap meet listings.

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Easy Access BBS. (415) 829-6027. 300/1200/2400 8-N-1 Sysop: Tony Waddell.

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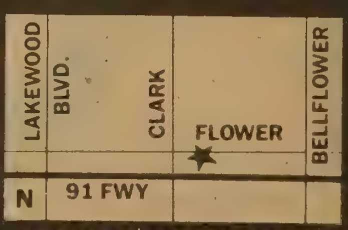

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714

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Adventurer's Castle. (714) 871-4119. 300/1200 24 hrs. Real time gaming. Sysop: William E. Hart

Amiga Friends. (714) 870-4754. 300/1200/2400 24 hrs. Run by one of S. California's largest Amiga clubs. Special interest sections, downloads, club activity information. Sysop: Scott Thayer

Amiga Inn. (714) 272-5881. 24 hrs., 300/1200/2400. Sysop conference, large BBS lists, programming, downloads, more. Sysop: Steve Snyder.

Bits & Pieces Time BPT-Main. (714) 630-8897. 300/1200/2400 24 hrs. No parity, full duplex. BBS determines baud rate by ret. key. Large software library for Commodore 64/128, Amiga & IBM. Sysop: Mike Dalton

C. Itoh Technical Support BBS. (714) 660-1698, N-8-1, 24 hrs., 1200. Free technical support for C. Itoh printers and terminals. Switch settings, printer drivers, utilities. Sysop: George Petronis.

C.A.T. (Computer Aided Terminal). (714) 979-8333 8-N-1, 24 hrs., 300/1200. For C-64/128 computers. Sysop: A.W.K.

Calsonic. (714) 830-5958. Password=CII. Use real names. Sysop: Kerry Williams

DCASPRO-HUGHES RBBS. (714) 732-6659. 24 hrs., 300/1200/2400. Federal government/multi SIGS/ virus info center/largest listing of BBS numbers for 714 area code. Sysop: John A Sprague, Sr. Voice: (714) 732-3698 days.

Dial-Your-Match. (714) 682-8763. Riverside. (714) 739-8822. Buena Park. (714) 751-4860. Santa Ana. (714) 773-5326. Fullerton. (714) 825-0901. Colton. (714) 857-2470. Irvine.

French Connection. (714) 858-8111. 300/1200/2400/9600. 16 multi-line BBS in Orange County. Dating service; 500 megs of software for users. Sysop: Stephen M. Cohen

Fretwork. (714) 974-7428. 300/1200 24 hrs. Punter protocol for file transfers. Commodore specific. C-TUG members's night - every Fri. Sysop: Jeff Griffith

Happy Trails. (714) 547-0719. 1200/2400 8-N-1 24 hrs. MS-DOS; Multi-user; E-mail; Downloads; SIG's; On line games Sysop: Don Inglehart

Imperial Palace of DB. (714) 860-0889. 1200 24 hrs. Commodore 64, 128.

MacUnderground. (714) 846-8866. 24 hrs., 300/1200/2400. Macintosh only. News, reviews, apps., 80 megs online, updated weekly, full Mac support. Sysop:

MEDCOM INFO BBS. (714) 996-6666. 24 hrs., 300/1200/2400. Multi-user games, chat, computer art, PC-Pursuit access & info, news IBM-PC freeware/Shareware & mail. Sysop: Bob Reinecke.

Morrison Hotel. (714) 752-0145 24 hrs., 300/1200/2400. 10 lines, interactive games and conversation. Conferencing, email and matchmaking. Technical and trivial discussion. Running Skynet software.

Nebula 6. (714) 595-6577. 300/1200/2400 8-N-1 24 hrs. Write for a free newsletter. P.O. Box 1071, Walnut, CA 91788. PC-Pursuitable. Sysop: Michael Quirino

Network XXIII. (714) 548-4836. 1200/2400/9600 8-N-1 24 hrs. On-Line registration; 1500+ files; conferences; online games. Sysop: Jim Brandon

PC Exchange. (714) 956-5468. 1200/2400/9600.

PC-Lair. (714) 839-9580 N-8-1, 24 hrs., 300/1200/2400. PC/DOS, MS/DOS, large PD software library. Sysop: Eric Drochner.

Software Exchange. (714) 552-3515. 300/1200/2400 8-N-1 24 hrs. For IBM & compatibles. Over 3000 programs in 152 megs. Fastest-growing BBS in Southern California! Sysop: John Coon

The Byte Zone. (714) 491-7635. 300/1200 24 hrs. Serves all Tandy computers & many others, incl. MS-DOS. Features adventure help files, elect. mail,message bases, etc. Sysop: Franco Collino

The Cheese Factory. (714) 788-9894. 24 hrs., 300/1200/2400. Official BBS of the Moreno Valley Macintosh User's Group. Macintosh PD software library available for d-load. Sysop: Mike White.

The End of the Line. (714) 645-6581. 300/1200/2400 8-N-1 24 hrs. Running Wildcat BBS software. Pub. dom.& shareware for IBM & compatibles. Private/pub. message bases. Scorecast data files. Sysop: Bob Kelly

The Grapevine BBS. (714) 549-7886, 24 hrs., 300/1200/2400. 40 & 80 column support on WWIV BBS software. A new telecommunications related BBS. First online 8-8-88, 24 message forums, file transfers of communications related software for all major PCs.

Toshiba BBS. (714) 837-4408. 1200 8-N-1 24 Hrs. Toshiba laptop support.

TripWire TECHnologies (PCB). (714) 964-1146. 1200/2400 24 hrs. Multi-lingual operations with 7 national echomail areas. (Beta testing PCBmail) Sysop: William Kidd

Wellspring RBBS. (714) 856-7996. 300/2400 M-F 5 PM-8 AM. S-S 24 hrs. Medical/AIDS/Software.

West Monster Castle BBS. (714) 894-3394 8-N-1, 24 hrs., 300/1200/2400. Located at The Federated Group #03, Westminster, CA. Sysop: Ernie Braza.

717

Dead Board. (717) 677-9573. Sysop: Captain Trips.

800

APPLESIG on the Source. (800) 336-3366, 300/1200/2400. International Apple users group with over 700 programs. Fee.

PC Pursuit. (800) 835-3001, 300/1200/2400. Registration required.

805

Affection Connection. (805) 499-7023/529-7311. 24 hrs., 300/1200/2400. 5 lines, private open chat, message board, matchmaking, free public domain software. All computers welcome. Sysop: Ben Richards .Voice: (805) 499-4625.

Success BBS. (805) 238-7359. 300/1200 24 hrs. Sysop: Larry Sarver

The Digital Dungeon. (805) 683-2436. 300/1200/2400 8-N-1 24 hrs. Open System designed to be an open forum. Primarily a conversation system. Sysops: Jerry Ash, Doug Sander

818

Affection Connection. (818) 991-8261/704-8588. 24 hrs., 300/1200/2400. 5 lines, private open chat, message board, matchmaking, free public domain software. All computers welcome.

AMERICOM C.B.C.S. (818) 967-3108, 10 PM-7 AM, 300/1200. Supports all computers. Mature users, 20 multi-topical subs; test information libraries, section for film/TV production, medical/nursing, home audio/video, photo, debate, religions, hobby, consumer help, HAM and more. Online for over four years. Sysop: Mike L. Lewis.

DELOS. (818) 242-1410. 2400 24 hrs. Lo-cost access or free ltd. use. Serving the Gay Community. 10 lines for chatting! Library & many public boards.

Dial-Your-Match #1. (818) 842-6900. 300/1200 24 hrs. The original dating BBS on-line since 1981. Fill out a personalized questionnaire & join the fun! (818) 247-6343. Glendale. (818) 506-6300. N. Hollywood. (818) 785-3498. Van Nuys. (818) 845-5325. Burbank. (818) 954-0790. Burbank.

Fantasy Plaza. (818) 840-8066. Online adventure game.

Hard Ball PC Board. (818) 713-0420. 1200/2400 8-N-1 24 hrs. Programming conference specializing in Pascal. Huge P/D & Shareware Filebase for PC & compatibles..Sysop: The Umnpire.

Home Loans BBS. (818) 999-1501, 8-N-1, 24 hrs., 300/1200. Daily update of mortgage rates. Sysop: Online Motgage Services. Voice: (213) 316-5508.

LA JOBS. (818)999-1501.Los Angeles' most extensive database of Eng./tech jobs openings. Email direct to employers. Service provided by Los Angeles employers. No agencies. Type GO JOBS upon entry.

Loan Line. (818)999-1501. Type GO LOAN upon entry.

Lynzie's Motherboard. (818) 508-6482., (818) 989-3875. 300/1200/2400/9600 8-N-1 24 hrs. Matching, group and private chat system, local social events. S.F.V. Sysop: Lynzie Flynn

Mysteria. (818) 353-8891. 300/1200/2400. Occult & general text files, CP/M, turbo Pascal. Sysop: Phil Hansford

Oracle. (818) 509-9681. 300/1200/2400 8-N-1 24 hrs. 9 phone lines. System password MICROTIMES for higher access. Free demo version of Oracomm BBS software. Sysop: Gary Young

ORCHID. (818) 999-1501. Direct access to employers. We are not a job agency. Type GO JOBS upon entry. Sysop: Mindey.

Plaza Party Line. (818) 842-3322. 300/1200. Chat with 11 other callers. No hourly charges. Adult sections. Lots of women callers. Online since 1983.

Teleweb Valley. (818)999-1501.Los Angeles 818 access number.

The Bear's Lair. (818) 988-6694, 300/1200/2400, 24 hrs. Macintosh oriented, 200Mb on line, multiple message sections. Sysop: Bruce Gerson.

The Board with No Name. (818) 785-3340. 300/1200. A gay-oriented BBS. No hourly fees; no time limit w/ paid access. 16 lines.

The Consumer & Business Network. (818) 360-4679. 24 hrs., 1200/2400. Arc files, business and financial info, classified ads, discussion, Mac files, messages & mail, newsbytes, on-line store, real estate, USA Today, Westlink Report & HAM radio, PC Pursuitable. Sysop: Kenneth R. Wilcox.

The Ledge PC Board. (818) 352-3620. 300/1200/2400/9600. All systems welcome, full support for IBM PC/AT compatibles.

The "Other" Ball. (818)358-6968, N-8-1,24 hrs. Adult, live chat, straight/gay dating database, IBM software, business files, PC–Pursuitable.

The Software Bank. (818) 993-5516. 300 to 9600. Atari ST only. 65 megs. Node #95 of FNET. Exchg. messages & files w/users on other FNET BBS nationwide thru our network. Sysop: The Software Bank

TUG-NET (Technical & User Groups Network). (818) 882-6045. MS/DOS and CP/M supported. Voice: (818) 957-4721.

Valley On-line Shopping Network. (818) 772-4227. 300/1200 (soon to be 2400). Provides local businesses the opportunity of selling their products on-line to local and national computer consumers. Sysop: BRAINS.

VICUG-BBS. (818) 772-4227 N-8-1, 24 hrs., 300/1200/2400. See what is happening at VICUG (speakers, demos, newsletter, (VICUG-RAM), disk bank, desktop publishing sub group, etc. Sysop: Linda Rohrbough. Voice: Harry Tischler, (818) 997-6000.

916

24th Street Exchange. (916) 451-7179. 300/1200/2400 8-N-1 24 hrs. Opus-based system. Free access. Lge. selection pub. domain files for IBM & compatibles. Special interest areas. Sysop: Don Kuhwarth/Laura Stua.

Changewinds HST. (916) 923-3862. 24 hrs., 300/1200/2400/9600. This system specializes in keeping the highest quality files online. TradeWars 1000 v9.03, 18 MHz system, many echomail conferences. Sysop: Ron Deaver.

CompuHelp. (916) 786-3923. 24 hr database-bulletin board system for the Blind and Visually Impaired. Sysop: National Association Of Blind And Visually Impaired Computer Users, Inc.

Dial-Your-Match. (916) 275-1265. Redding. (916) 736-0739. Sacramento.

Hackney's Hideout BBS. (916) 961-1042. 1200/2400 8-N-1. Includes AT&T users conference. Sysop: Rich Hackney.

Night-line Network Central. (916) 331-5043, 300/1200, 8:00 PM to 8:00 AM daily. Forum for individuals, clubs and organizations that want to network nationally with others. Sysop: Eric Thomas.

Phoenix Landing BBS. (916) 966-8243. 300/1200/2400. Macintosh oriented but many other computers are supported. File areas for Mac and other computers. Supports echomail conferences including ECHOMAC and BAYMAC.

ASSOCIATIONS

AACCPAC Accounting SIG Of UCLA Users Group. Meeting: 2nd Wednesdays @ 7 PM. Users, CPAs, consultants and other business people interested in sharing information on Computer Associates ACCPAC Accounting Software. Call Donna Miller, (213) 393-0244.

California Educational Computing Consortium CCCE. For information write Herb Garrett, Long Beach City College, 4901 E. Carson Street, Long Beach, CA 90808.

Computer Professionals for Social Responsibility. Meetings: Most third Wed. 7:30 PM UCLA. CPSR/LS focuses on computer system risk and reliability and on privacy and civil liberties issues.

International Blind Users Group (I-BUG). Part of the National Association of Blind and Visually Impaired Computer Users. Membership consists of access to CompuHelp, a 24 hour online database/bulletin board system, and receiving CompuHelp On-Disk, a modem database-bulletin board system on two double-sided disks. (916) 783-0364 or 645-8036.

L.A. Real-Time Problem Solvers. Meetings: 4th Saturdays, 10 AM to 1 PM. Hawthorne Public Library, 12700 S. Greviellea Ave., Hawthorne. We speak A/D, SBC, RISC, FORTH and C. We support real-time, real-world hardware and software problem solving, such as firmware, device drivers, instrumentation and very smart toasters. (213) 371-0589.

North Orange County Computer Club (NOCCC) Meetings: Monthly on Sunday, @ Chapman College near downtown Orange. Help for beginners, SIGs, educational activities, monthly newsletter. Open to any computer user. (714) 998-8080.

Realtor Microcomputer UG (RUG). Meetings: 4th Thurs. 7 PM Pasadena BOR, cnr. Orange Grove & Los Robles, Pasadena, CA.

USER GROUPS

AMIGA

Amiga Friends. Meetings: 3rd Sun. Rancho Santiago College, Rm R-124, 17th & Bristol, Santa Ana. Call for current meeting info: (714) 775-7237 (24 hrs.) or write: P.O. Box 4186, Huntington Beach, CA 92605.

Amiga Special Interest Group. Meetings: 1st Sunday except holidays. Chapman College, 333 N. Glassell, Orange, CA. Amiga SIG is part of the North Orange County Computer Club, a thousand member organization together 12 years.

Amiga User's Group Of Long Beach. Meetings: 3rd Sundays, 1 pm, Mid-Cities National bank, Lakewood and Artesia, Bellflower. Tech, Beginners, Video/Graphics sigs. (213) 422-8226/432-2088.

Bits & Pieces Amiga Group of Anaheim. Meetings: each Tues. 6:30-10 PM 1130-A North Kraemer Blvd., Anaheim, CA. DOS Classes, tech. help & more. BBS: (714) 630-8897.

LAAUG-Los Angeles Amiga Users Group. Meeting: 3rd Wednesdays @ 7:30 PM. Veteran's Auditorium at Overland Ave. & Culver Blvd. Many SIGs, Rookie, music, video, monthly PD disks.

Pacific Computer Club. Meetings: 2nd Thurs. 7 PM 391 S. Madison, Pasadena, CA.

San Fernando Valley Amiga Users Group (SFVAUG). Meetings: 2nd Thursdays, 7 pm, American Legion Hall, 7338 Canby Ave., Reseda. Call: Randy, (818) 719-9211.

South Bay Amiga Dudes. Meetings: 3rd Thursdays, 7 pm, Redondo Beach Blvd., Lawndale. Call: Charlie Breene at (213) 540-2834.

South Orange Commodore Klub (SOCK). Meetings: 3rd Saturday 9:00 A.M. Union Savings, 23688 El Toro Road, El Toro, CA. For Commodore 64/128 users and Amiga users. One-hour general meeting is followed by separate group meetings for each.

AMSTRAD

Amstrad Users Club Of Orange County. Meetings: 3rd Saturdays, 10 am til 2 pm. Board Room upstairs in the Santa Ana Library, Civic Center & Ross streets. For more information call: (714) 953-6471.

Amstrad Users Group, USA. Meetings: Free mail and phone support for PCW. 12741 Matteson Ave. #3 LA 90066. (213) 397-7981.

APPLE

Apple/Valley Computer Club. Meetings: 2nd Wednesdays, 7:30 pm, Valley Presbyterian Hospital, meeting room #3. Discussion on Apple, Mac, Amiga, IBM. BBS: (818) 782-6471. Up loading/down loading. Visitors welcome. Eamon games, misc. Voice: (818) 988-1752.

Original Apple Corps. Meetings: 2nd Sun. 12:00 Noon 3rd Floor Community Room, Santa Monica Mall. First Apple group ever. SIGs for AppleWorks, Telecomm, Educators, Macintosh. Call Fred Duffy at (213) 396-5515.

Tri-City Apple Users Group. Meetings: 3rd Thurs., 7:00 PM, 50 N. Hill Ave., Pasedena. Call (818) 846-6682. Friendly Apple II experts.

ATARI

Atari Computer Association Of Orange County. Meetings: 2nd Sun. Rancho Santiago College, Room W101, Santa Ana. BBS: (714) 540-7378.

Atari Computer Enthusiast Society. (ACES). Call: Perry Robins, (818) 760-7210.

Santa Clara Valley Atari Computer Enthusiasts (SCVACE). Meetings: 1st Thurs. 7PM Mint Canyon Moose Lodge, 18000 W. Sierra Hwy, Canyon Country. 8-bit group. Atari ST special group now forming.

South Bay Atari Computer Enthusiasts (SBACE). Meetings: 2nd Tuesdays, 7:30 pm, Lomita VFW Hall, 1865 W. Lomita Blvd., Call: Alan, (213) 542-7870.

South Bay Atari ST Computer Club. Meetings: last Mon. 8 PM 15331 Praire Ave. Lawndale.

COMMODORE

Bits & Pieces Commodore Computer Group of Anaheim. Meetings: each Tues 6:30 PM 1130-A N. Kraemer Blvd. (Kraemer & La Palma), Anaheim. Offers public domain software, demonstrations, interactive training on your computer. $33 annual dues.

Commodore 64 Software Users Group. For new Commodore owners. One on one help. Call (714) 531-2977 for info.

Mother Lode Commodore Users Group. Meetings: 2nd & 3rd Thursdays. Calaveras County Water District Board Room. Supports the Commodore PET, VIC, 64, Plus/4, C-16 & 128.

Nebula 6. Call BBS for more info & online glance at what group offers. BBS (714) 595-6577 300/1200/2400. Write for info: P.O. Box 1071, Walnut, CA 91788.

OKOK Computer Users Group. Meetings: 2nd Wed. 7-9 PM Altadena Public Library, 600 E. Mariposa. Call (818) 794-3243. Serves, Osborne, Kaypro, Commodore C128, PCs and compatibles and both MS-DOS and CP/M operating systems.

Orange County Commodore Technical Users Group (C-TUG). Meetings: 4th Sun. 11:00 AM ,4th & Tustin, P.O. 1497, Costa Mesa, CA . 92628. Newsletter; 2 BBS's; door prizes; demos, raffles, speakers, (714)750-3003

Pacific Computer Club. Meetings: 2nd Thurs. 7 PM 391 S. Madison, Pasadena, CA.

Pasadena Commodore Computer Club. Meetings: 1st and 3rd Weds. 7:00 PM Circadian Room, Pasadena City College Cafeteria. Colorado Blvd & Hill, Pasadena. Call (818) 447-2212 after 2:30 PST or write P.O. Box 163, Arcadia, CA 91006. Supports C64 and 128 machines.

South Bay Commodore Users' Group. Meetings: 4th Tuesdays, 7:00 pm, Home Federal Savings Conference Room, 1670 Pacific Coast Highway, Redondo Beach.

South California Commodore Users Group. Meetings: 3rd Tuesday each month, 7:00 P.M., MidCities National Bank, Lakewood and Artesia Blvds., Bellflower, CA.

South Orange Commodore Klub (SOCK). Meetings: 1st Wed. 7 PM Laventhol & Horwath, Exec. Conf. Rm.7th Fl., 3699 Wilshire Blvd., LA, CA.

dBASE

UCLA PCUG dBASE SIG. Meetings: 3rd Wednesdays, 7:30 pm. Call: (213) 874-7471.

Valley West dBASE Users Group. Meetings: 3rd Mon. 7:00 PM Blue Cross Of California, 21555 Oxnard St., Woodland Hills. Call (818) 343-9033 or write P.O. Box 16971, Encino, CA 91416.

DEC

DECUS Rainbow Pacific PC-LUG. Meetings: 2nd Wed. 7:00 PM Digital Equipment Corporation, 6101 W. Centinela, Ave., Culver City. Digital Equipment Computer Users Society. Free to DEC users. Call Karen Danforth (818) 787-8736 or write P.O. Box 2278, Van Nuys, CA 91404.

DESKTOP PUBLISHING

VICUG–DTP. (Valley IBM/Compatibles Users Group). Meetings: 2nd Fridays, 7:30–10:00 pm. Valley Plaza Recreation Center, 12240 Archwood St., North Hollywood, CA. Call: Harry Tischler, (818) 997-6000.

EPSON

San Fernando Valley Epson QX User Group. Meetings: 3rd Tues. 7 PM Fallbrook Sq. Comm. Rm., Fallbroook Mall, 6633 Fallbrook Ave. Canoga Park.

IBM AND COMPATIBLES

Calsonic PC Club. Meetings: 1st Tues. 5:15 PM 9 Holland, Irvine, CA.

Greater South Bay PC User's Group. Third Thursdays, @ 7 PM, Building behind Christ the King Lutheran Church, 2706 W. 182nd St. Torrance. Newsletter, BBS, more! Guests welcome. Call for more information. Evening: (213) 532-2123.

IBM & Compatibles Users Group-Ontario Area. For information call: (714) 982-1270.

Kenny's Computer Club. Meetings: Each Saturday 8:00 A.M.

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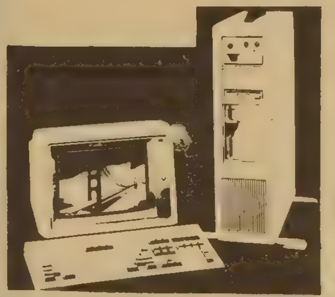

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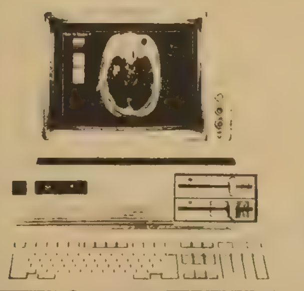

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Kern Independent User Group. Meetings: Write Kern Independent PC User Group, P.O. Box 2780, Bakersfield, CA 93303.

Long Beach IBM Users Group. Meetings: 3rd Tuesdays. 7 PM, Woodruff Medical Plaza, 3816 Woodruff Ave., Room A, Long Beach. Contact: Jim Wells: Call: (213) 439-7114.

OKOK Computer Users Group. Meetings: 2nd Wed. 7-9 PM Altadena Public Library, 600 E. Mariposa. Call (818) 794-3243. Serves, Osborne, Kaypro, Commodore C128, PCs and compatibles and both MS-DOS and C/PM operating systems.

Orange Coast IBM PC User Group. Meetings: last Sat. 9 AM Science Hall, Orange Coast College, Costa Mesa, CA.

Orange County IBM PC Users Group. Meetings: 2nd Thursdays 7:30 PM. Bradford Retirement Community Center, 1180 N. Bradford, Placentia. Meetings feature guest speakers on hardware and software topics related to the interest of our members. Other activities include sharing tips and problems, access to club library and a club newsletter. Call: Mike Lyons, 2114 W. La-Palma, Anaheim, CA 92801. (714) 774-3236.

Pacific Computer Club. Meetings: 2nd Thurs. 7PM 391 S. Madison, Pasadena, CA.

Pasadena IBM Users' Group. Meetings: 3rd. Wed. CalTech, Bridge Bldg., Rm. 201.

PC*UG Computer Club. For Hughes Aircraft Employees. Call (213) 334-3422.

QUICK & EASY Mailmaster User Forum. Meetings: monthly LA/Airport area. Users interested in maximizing performance of Quick & Easy.

Saddleback College IBM-PC Users Group. Meetings: 3rd Sat. Room 210, Business and General Science Building, Saddleback College, Mission Viejo. Call Susan Gordon at (714) 582-4650.

South Bay Users Group (SBUG). Meetings: 1st Sun. Mercury Savings, Long Beach, CA.

South County PC Users Group. Meetings: 3rd Sat. 9 AM Great American Savings, 23688 El Toro Rd., El Toro, CA.

Technical Users Group (TUG-NET). Meetings: Call for info (818) 882-6045. BBS (818) 882-6045.

The IBM & Compatibles User Group (ICUG). Meetings: 4th Thurs. 6:30 PM or 7:30 CAL Lutheran Univ., 60 W. Olsen Rd., Thousand Oaks. Group is 5 yrs. old & has 150 members Meetings begin at 6:30 for beginners, 7:30 regular members.

The Southern California K-Man Users Group. Meetings: 1st Wednesday, 7:00 P.M., Laventhol and Horwath, Executive Conference Room, 7th Floor, 3699 Wilshire Blvd., LA. Demo of the month features new software and hardware.

TRS Nybblers. Meetings: 1st Wed. 7 PM 2006 W. Magnolia, Burbank. Supports MS-DOS, CP/M, IBM or IBM clones.

Valley Computer Club—IBM. Meetings: 1st Wednesdays, 7 pm, Burbank Bd. of Realtors Bldg., 2006 W. Mangolia, Burbank. Call: Aaron Epstein, (818) 769-1837.

VICUG (Valley IBM/Compatible Users Group). Meetings: 4th Fridays, 7:30 pm, Mercury Savings Bank, 14801 Ventura Blvd., Sherman Oaks.. Call: Harry Tischler, (818) 997-6000.

VICUG–DTP (Valley IBM/Compatibles Users Group). Meetings: 7:30–10:00 pm, Valley Plaza Recreation Center, 12240 Archwood St., North Hollywood, CA. Call: Harry Tischler, (818) 997-6000.

KAYPRO

OKOK Computer Users Group. Meetings: 2nd Wed. 7-9 PM Altadena Public Library, 600 E. Mariposa. Call (818) 794-3243. Serves, Osborne, Kaypro, Commodore C128, PCs and compatibles and both MS-DOS and C/PM operating systems.

LEADING EDGE

Leading Edge Computer User Group of Ventura County. Meetings: 2nd. Sat. 10 AM Camarillo Library, 3100 Ponderosa Dr., Camarillo, CA. Lectures on hard/floppy disk usage; program demos; beginner classes. Single: $20, couple $25.

MACINTOSH

California State University Macintosh Users Group. Meetings: California State University, Long Beach.

Conjo Ventura Macintosh Users Group, Inc. Meetings: 1st Thursdays, Thousand Oaks Public Library, 1401 E. Janss Road, Thousand Oaks. Call: Ed or Ellie Darling at (805) 584-8733.

LAMG (Los Angeles Macintosh Group). Meetings: Call (213) 278-LAMG or write 12021 Wilshire Blvd. #349, Los Angeles, CA 90025.

MacValley. Meetings: 3rd Tues. 7:30 PM Burbank High School Cafeteria at Burbank Blvd. and Third St. Call David Lagerson, (818) 998-5546or write P.O. Box 4279, Burbank, CA 91503.

Moreno Valley Macintosh Users Group (MVMUG). Product demos, newsletter, SIGS, BBS, more! For information about the club and meeting call: (714) 684-1337.

Original Apple Corps. Meetings: 2nd Sun. 12:00 Noon 3rd Floor Community Room, Santa Monica Mall. First Apple group ever. SIGs for AppleWorks, Telecomm, Educators, Macintosh. Call Fred Duffy at (213) 396-5515.

San Gabriel Valley Macintosh Users Group. Meetings: 1st Thursdays, 7:30 pm, Pasadena City Library, 285 E. Walnut. (213) 684-4266.

SBAMUG (South Bay Apple Mac User Group) Meetings: Last Wednesday of each month, 7:30 PM, Ticor Title, 4240 Artesia Blvd., Torrance. Call (213) 316-7738.

South Coast Macintosh Users Group. Meetings: First Tuesdays, @ 7 PM, Goleta Library. Publishes a newsletter with reviews, offers advice, support for Mac users, discounts at local dealers. Call: Vince Leamons, 685-7295.

West Orange County Macintosh Users Group (WOCMUG). Meetings: Last Tuesday. F & M Bank in Rossmore Center, Orange County, CA.

Whittier Area Mac Users Group. Meetings: 2nd Saturdays, 10 am, Granada Heights Friends Church, 11818 S. La Mirada Blvd., Rm. C-21. (213) 691-1622.

NETWARE

Orange County Network Users Group (OCNET). Meetings: 2nd Tues. Wyle Labs, Irvine CA. Open to users, consultants, all interested in NETWARE. Call Mark at (714) 955-0616

Netware User Group Los Angeles (LOSNET). Meetings: 2nd. Wednesdays. Welcomes consultants, CPA's, dealers and users interested in sharing information on NETWARE and related products. Call Fane, (213) 452-1335. 2716 Ocean Park Blvd, Santa Monica 90405.

OPEN SYSTEMS

Open Systems Accounting, So. Cal Users Group (OSASCUG). Meetings: 4th Wed. Wyle Labs, Irvine, CA. Users of Open Systems, Altos Accountant, CADO, & Rexon accounting software. Open to end users, dealers and consultants. Call Mark at (714) 955-1724.

OSAS Systems Users Group Los Angeles (OSASUGLA). Meetings: 1st Wednesdays. Welcomes consultants, CPA's, dealers, users and QI's interested in sharing information on OSAS and related products. Call Fane, (213) 452-1335. 2716 Ocean Park Blvd., Santa Monica 90405.

OSBORNE

OKOK Computer Users Group. Meetings: 2nd Wed. 7-9 PM Altadena Public Library, 600 E. Mariposa. Call (818) 794-3243. Serves, Osborne, Kaypro, Commodore C128, PCs and compatibles and both MS-DOS and C/PM operating systems.

TANDY/RADIO SHACK

Los Angeles - Wilshire Color Computer Users' Group. Meetings: 2nd Sat. 12:30-5:30 PM Felipe de Neve Library's Comm. rm., 2820 W. 6th St., LA, CA.

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LA 99er Computer Group, 4th Wednesdays, August 24, Sept. 28, Oct. 26. @ 7:15 PM, Torrance Public Library, Torrance Blvd. @ Madronna. Call: Teresa Masters, (213) 271-6930.

San Fernando Valley TI-99/4A User Group. Meetings: 2nd Wed. 7:30 PM Doctor's Conf. Rm., Sherman Oaks Hospital, 4929 Van Nuys Blvd. Call for info: (805) 379-2937. Or write: SFV 99ers, 633 Hollyburne Ln., Thousand Oaks, CA 91360.

TI Professional. Call (213) 397-9668.

TI Users Group of Orange County. Meetings: 3rd Thurs. Peek Funeral Home, 7801 Bolsa Ave., Westminister. Call 633-7317.

TIMEX/SINCLAIR

Timex-Sinclair Users Group. Meetings: 3rd Mon. 7 PM 11828 Jefferson Blvd., Culver City, CA.

Timex-Sinclair. Meetings: Call John W. Petersen (213) 545-9581 or George Kuby at (213) 551-9454. BBS: Grey Matter (213) 971-6260.

Send your User Group or Bulletin Board listing to:

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(Please limit descriptions to 15 words or less.)

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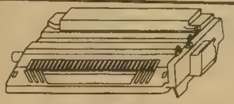

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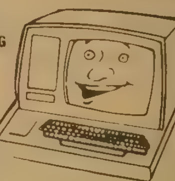

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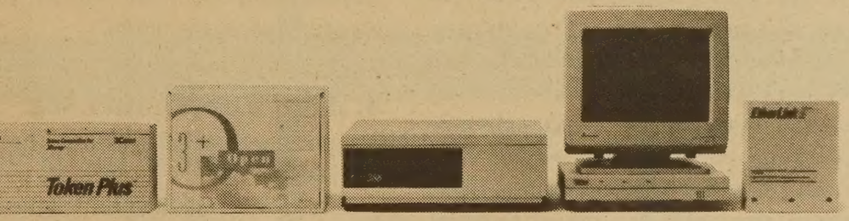

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DVORAK'S LAST COLUMN • BY JOHN C. DVORAK

I Can't Throw Anything Away Anymore

Dvorak's IN Basket Revealed

Over the years I collect a basket full of snippets and items that I intend to use but which somehow become dated or forgotten. I keep these items in little computer files and always promise to toss them out when they get too old. When I read them I decide they are too good to discard. Until now I haven't found a use for any of the following items:

***

Memo From Paul Hoffman

Subject: Annals of computer junk mail

You can tell that there is a drug problem in the advertising industry. On the outside of a piece of junk mail from *UNIX Today*: "Introducing a newspaper as exciting as the market it covers!"

***

Memo from An Anonymous Source

Subject: Borland Rumors

John, Total rumor: Borland is an acquisition candidate. Rumor level rumor is that Microsoft is interested.

And cows can fly!! —JCD

***

Letter From Joe

John,

I just read your column in the Vol8N2 *PC Magazine* issue about the shabby treatment IBM gave you, and feel I can now mention something one of our IBM Field Engineers told me about a month or two ago.

Seems in their efforts to cut costs (gotta keep that "no layoff" policy alive!), IBM put out the word to all its field people that if they wished to take a client to lunch, or pick up any expenses, they were on their own—IBM would no longer reimburse them! They would just have to take it off their taxes as a business expense at the end of the year.

Sad—IBM's strength was always its marketing, and it seems to have forgotten even how to do that right.

***

Doug Ruby On Networks

John, after 3 years of IBM mainframe software development, 7 years at DEC, and now 5 years working for LAN vendors, I have a couple more little aphorisms for your favorite network sayings:

1. The first law of networks....They always grow.

2. The second law of networks....They don't work......Unless you plan them to.

3. The third law of networks....If you don't pay attention to the first two...you are in deep <expletive deleted>.

Having been a practitioner, I find myself being consistently more skeptical about the general nature of vaporware in the PC industry (LANs included) in general. I think your hostility is healthy, but misplaced when you are trying to get an organization to work together instead of being an anarchy.

***

IS THIS CORRECT?

Federated opens up a 2800+ square foot computer department in its Hollywood store (LaBrea & Sunset). It has Atari 520STFM, 1040STF, Mega, and 8-bitters; PC-compatibles (a PC, a turbo XT, a 286); Atari, Nintendo, and Sega games. It has lots of computer books—more titles than B. Dalton at prices 10% below Crown books. There's a big selection of PC software and a huge selection of Atari software—and a Special Order Desk will find and get any piece of anybody's software on request, by name or by description, an absolute WILDCARD. On display: Work Center clusters (Learning Center, Desktop Publishing Center, Graphics Center, Music Center) with complete, working systems at each of three levels of sophistication in each cluster. Also on hand: peripherals, accessories, the works. There's also a gonzo games area, and a Home Office Center complete with copiers, FAX, phones, answering machines, more.

***

J. Alan Rueckgauer sez:

People may be belly-aching, but not because of indigestion...

The problem is the politics involved. I'm an ex-IBMer, and understand the inner-workings quite well. In a nutshell, the IBM Modus Operandi is to create markets for products, then do-in the competition by simply abandoning it. Any competitor that is capable of it merely follows IBM's lead. The rest just struggle in the aftermarket or die.

The whole issue of IBM killing off the PC market is something very subtle. You have to be able to read into the motives behind any marketing move, be it an ad campaign or a product line. MCA is one of the warning signs that IBM's got a fast move in the making, and tripping-up the competition is the end result. They're the real reason that third-party support for PS/2 isn't where it was for the PC in a comparable point in the life cycle. They make a big deal about how wonderful MCA is, then come out with another model based on the AT (albeit crippled). Some people say "Gee, MCA must not be so hot, so we'll stick with the old way of doing things." Others are stifled by the licensing issues of MCA. And, just *why* do they have to have the Extended Edition of OS/2? Why did they suddenly make a big move towards putting connectivity with their heavy iron when there are already enough ways of stringing PCs off a mainframe? Why the dramatic shift towards SAA?

The answer is relatively simple: they want people hooked-up to their mainframes. They've learned quite a bit about interface techniques from seeing what works on the PC. The Database Manager in EE is not really intended for applications on the user side, but for interaction with the mainframes. Everything about their "bigger picture" says "workstation" instead of personal computing. Connectivity is suddenly an issue, and IBM wants to make absolutely sure you're connecting to *them* and not Wang or DEC or anyone else.

The intent is to leave the people who could care less about hooking up to heavy iron off in the hinterlands where they belong. They're not going to generate any significant revenue. It's their choice to stay with the old technology if it suits them. However, if you're part of the corporate world with your mondo data center and have to justify your spot on the org chart, you have to demonstrate the company can't afford to exist without you. How would you justify a million dollars a year or more in hardware and staffing expenses if all you're doing is payroll and accounting or acting as a library, especially if even the accounting department has put in PCs to do their spreadsheets and taken all that analytical work off the mainframe (and the corresponding workload)?

The only way IBM will retain its dominance in the world is to keep selling heavy iron. To do that, you need a way to sell it. Every one of my clients (most of them in the Fortune 100) have dramatically cut their MIS budgets because of PCs. If IBM can find a way to make the PC environment hostile to the average person, they have no alternative but to turn to the very people they've managed to turn their backs on. Give a Director of MIS a backlog that will justify him buying new machines, new software and hiring more programmers, and corp. management is going to look at what to cut to accommodate it, and it'll be the PCs, since everyone has to go to MIS for solutions.

Maybe I'm being cynical, but someone's putting the writing on the wall.

***

Now He Tells Me!

Dear John:

Let me tell you how much I've enjoyed your articles in *InfoWorld* and now *PC Magazine*. In fact, when you moved to your present professional residence, I let my *InfoWorld* subscription expire as, in my estimation, you were the only credible voice there. (They totally butchered a letter I wrote and twisted its meaning before publishing it. When I called and spoke to the woman who edited the letters section, she very rudely hung up on me when I complained.)

—Tony Stalls

John C. Dvorak graduated from the University of California. He is a contributing editor of PC Magazine *and* MacUser*, considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

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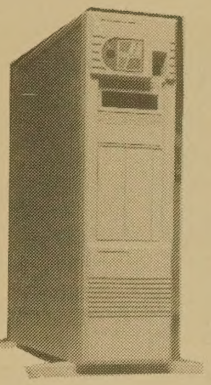

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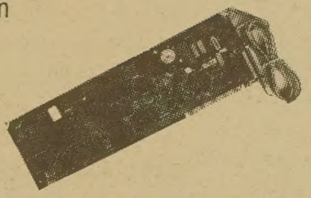

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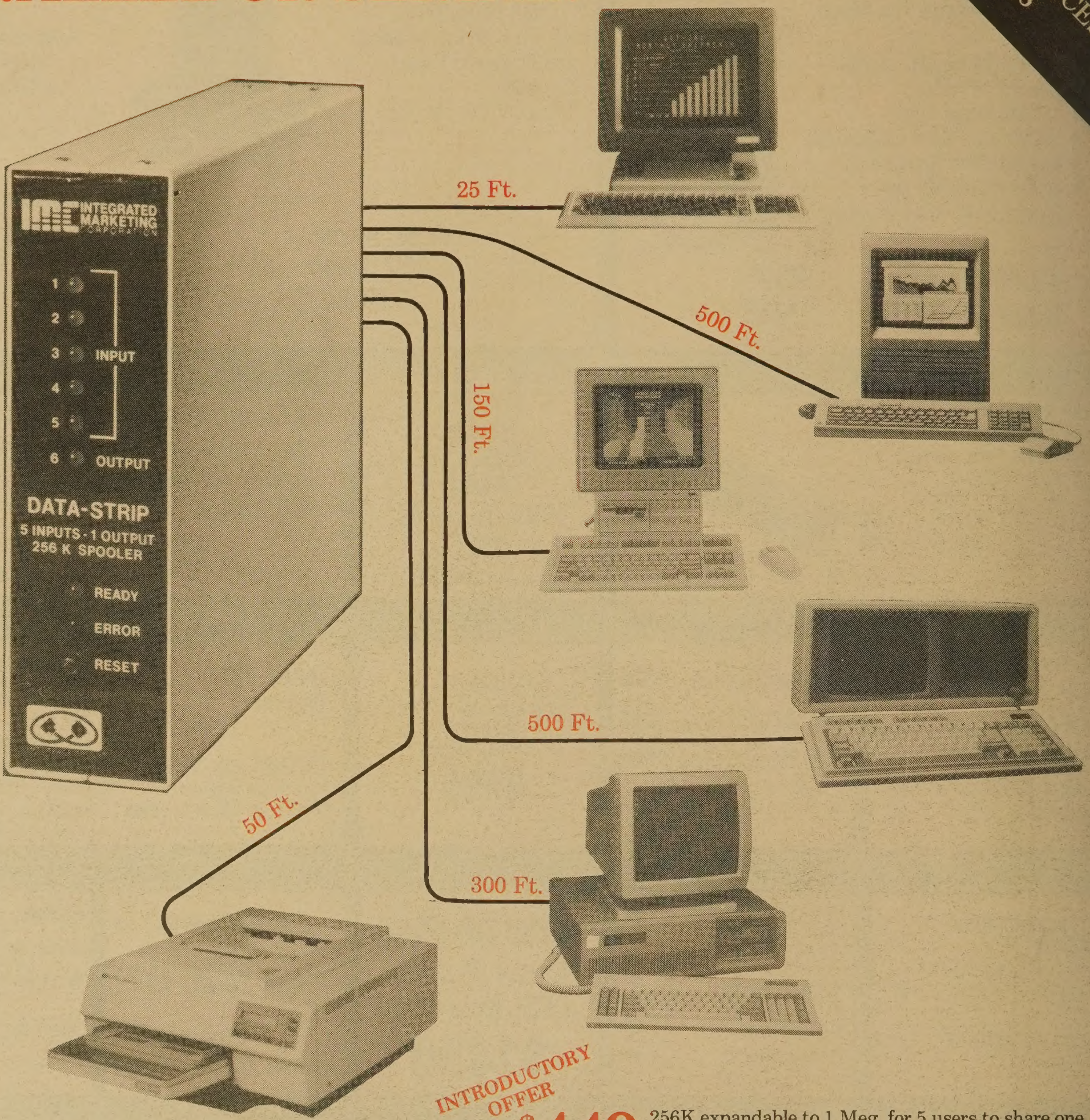

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